ILLINOIS MEDICAL JOURNAL

THE OFFICIAL ORGAN OF
THE ILLINOIS STATE MEDICAL SOCIETY

ENTERED AT THE SPRINGFIELD POSTOFFICE AS SECOND-CLASS MATTER

VOL. XVII SPRINGFIELD, ILL., FEBRUARY, 1910 No. 2

ORIGINAL ARTICLES

THE TREATMENT OF COMPOUND FRACTURES.*

EDWARD H. OCHSNER, B.S., M.D.

Attending Surgeon to Augustana Hospital; Adjunct Professor of Clinical Surgery, University of Illinois, Chicago.

CHICAGO.

Since a compound fracture is a fracture of the bone which is complicated by sufficient destruction of the superimposed soft tissues to cause a wound to exist between the fractured bone and the surface, the treatment of compound fractures requires attention to certain points and details which are not necessary in the treatment of simple fractures. The most important of these are the prevention of infection and the greater care and skill that is required to devise a retention dressing which will actually hold the fractured ends in apposition a sufficient length of time, without undue discomfort, and which will permit the inspection and dressing of the wound of the soft parts if this becomes necessary or desirable.

As many of these compound fractures occur in factories and on the street, the question of first aid is extremely important. It is consequently necessary to observe a few simple rules when one is called to one of these cases. The clothing should be cut open with a knife or shears, so that it may be easily removed, a piece of sterile gauze, or, if this is not at hand, a freshly laundered towel, pillow case or sheet, is wrapped about the injured member. If cotton is available it is applied over this and held in place by a snug bandage. If the hemorrhage continues in spite of this an Esmarch constrictor is applied. The extremity is now placed in a pillow, blanket or board splint and the patient is transported to the home, physician's office or hospital for further care. The injured part should not be handled roughly, unnecessarily manipulated or the deep wound handled or probed.

* Read before the Chicago Medical Society, in Symposium on Fractures, Oct. 13, 1909.

If the patient has reached his permanent abode, the first question that usually arises for decision is whether an anesthetic is indicated or not. In compound fractures I have practically always insisted on a general anesthetic, because one can be much more certain of rendering the field sterile. The only exception I have made to this rule is in compound fractures of the fingers and toes in a person who is willing and able to bear a moderate amount of pain. In these latter cases I have uniformly employed a little trick that I have found very useful. While the instruments are being sterilized I have the patient immerse the extremity in 2 per cent. watery solution of carbolic acid for five or ten minutes. If the rest of the necessary work is done reasonably dextrously and quickly this usually anesthetizes the parts sufficiently so as to make the necessary disinfection almost painless.

If the injury has been severe we must decide whether an amputation is required or not. In answer to this I would say that so long as the force which has caused the fracture has not cut off all the principal arteries supplying the part a primary amputation is never justifiable, as with proper treatment the extremity can nearly always be saved. I have never primarily amputated an extremity when there was any demonstrable arterial circulation left in the distal part. One can scarcely be too conservative in this matter. If the following directions are carefully carried out, one has practically nothing to lose in conservatism and often much to gain, for Nature has wonderful reparative powers, especially in the young, and many times almost completely severed extremities can be saved to the patient.

The next point of importance is that of rendering the area as nearly sterile as possible. After one of the above methods of anesthetization is effective, cover the wound with a piece of sterile gauze in order to prevent washing the dirt from the surrounding skin into the wound, then scrub the entire extremity thoroughly with green soap, water and brush and rinse with sterile water. Now take fresh water and gauze and clean the wound itself thoroughly in the same manner. In order to do this satisfactorily, many succeeding basins or pitchers of boiled water may be required. The whole limb, including the wound, is now carefully washed with ether, then thoroughly cleansed with turpentine, swabbed out with tincture of iodin and finally washed with alcohol.

For the purpose of removing grease and grime there is nothing quite so effective as turpentine, besides it is one of our best antiseptics. Tincture of iodin I have always used, because I know of no other so slightly toxic antiseptic whose antiseptic qualities affects so large a variety of pathogenic bacteria. Tincture of iodin also serves the useful purpose of searing over the raw surfaces. Many of these wounds cannot be rendered perfectly sterile by any of the means at our command, and if tincture of iodin is not employed a small focus of infection may contaminate the whole wound in a few days. If this agent is properly applied it will close the cut ends of all veins, lymphatics, tendon sheaths and bursæ and so completely sear all raw surfaces as to localize infection. It will also inhibit the growth of bacteria and prevent their rapid multiplication by

rendering the wound dry, thus decreasing the amount of available pabulum, and in that way give the patient time to erect his defensive barrier of leucocytes before the number of bacteria in the wound overwhelm him.

Tincture of iodin is also very useful in destroying the much-dreaded tetanus bacillus, though for this purpose it is no longer so essential as it formerly was, as we now have an excellent preventive in antitetanus serum. For the past six years I have always used an immunizing dose of antitetanus serum at the time of the first dressing in all badly contaminated cases of compound fracture, and in none of these did tetanus subsequently develop. The only case of death from tetanus complicating compound fracture that I have had in this period was in a physician who came to me six days after having sustained a compound fracture of the leg, who was suffering from severe sepsis when I first saw him and who developed tetanus within twenty-four hours after admission to the hospital and died three days later.

If a large quantity of street or garden dirt has been rubbed into the wound it is sometimes necessary to trim off the lacerated skin edges with a sharp knife and even to cut off small particles of muscle and fascia in order to satisfactorily cleanse the part, and in order to get at the pockets containing dirt it is sometimes necessary to enlarge the wound in various directions. By carefully and conscientiously following the above routine in every case I have never had a fatal or serious septic infection complicating a compound fracture, a fair proof, I believe, that this danger, even if it cannot be entirely eliminated, can be reduced to a minimum. After the wound has been rendered thoroughly clean, it is well to inspect it to determine the exact condition of the fracture, to carefully remove tendons and nerves, fascia, and pieces of muscle from between the ends of the bone, to remove detached spicules of bone, to ligate ruptured vessels, to determine how much one will do in the way of repairing severed muscles, fascia, tendons, and nerves, and how to drain.

In reference to the reuniting of torn tendons and nerves, I would say that if the soft tissues have been badly lacerated, if dirt and grime have entered the wound in considerable quantity, the less plastic work one attempts at the primary dressing the greater percentage of good results one will have. In such cases one's entire efforts should be directed toward saving the life and limb of the patient and to get good bony apposition, and to leave the suturing of the tendons and nerves to a subsequent plastic operation when the wound has been entirely healed for some time.

I am convinced that an attempt to do too much at the time of the first dressing often necessitates a subsequent amputation. Such plastic work not only increases the primary shock very considerably, but it also increases the danger from sepsis, and often interferes with the circulation of the extremity distal to the point of the wound and fracture.

The question whether the bone should be sutured or wired at the time of the primary dressing is often asked. I would say "No," most emphatically. By applying the proper retention apparatus, good bony apposition can be secured in almost every case without it, hence it is useless; and, as all useless things in surgery are bad, it should certainly not be

done in those cases in which good apposition can be secured without. Even where good apposition cannot be secured without it, it is better to allow the wound to heal first and subsequently do a bone suture operation. The great objection to suturing or wiring bone at the first dressing is the fact that it almost invariably causes more or less bone necrosis. This objection does not hold if one can bring the fractured ends together by passing the sutures through the fascial or tendinous covering of the bone, as in fractures of the patella.

We all know how long it takes for a piece of necrotic bone to separate. In some dog experiments several years ago I found that if the wound did not heal by primary union a small bobbin-like sequestrum would subsequently be exfoliated from each drill point. The same phenomenon I have several times seen after the use of the Parkhill clamp. This delays the first healing many months, and sometimes requires a subsequent operation for the removal of these sequestra.

The next question that has to be decided is usually the question of drainage, and with it the question of how much of the wound it is best to close. Of course, no hard and fast rule can be laid down, but I am of the opinion that the tendency is to close too much of the wound at the primary dressing. I am sure that it is much safer to err on the side of too little closure of the skin wound, because any defect can be easily and quickly closed later by Thiersch skin grafts, when all danger of sepsis has passed. Even wounds caused by the perforation of the bone will do quite as well if not sutured.

In a thoroughly drained wound severe septic intoxication is very rare, as the tendency of the lymph is to continually wash out the septic material, thus giving the organism a chance to protect itself by a wall of leucocytes. If the drainage is insufficient, the pathogenic bacteria and their toxins are constantly being forced into the lymph and blood circulation, the leucocyte barriers are again and again broken down, until the resisting power of the patient is finally overcome.

The form and kind of drainage employed will depend upon the nature of the wound. On the whole, I believe that split rubber tubes or cigarette drains are much to be preferred to the old-fashioned gauze drainage so much in vogue some years ago. It is all-important to secure thorough drainage the first few days until the leucocyte barrier is established. Gauze drainage is very apt to cause retention in pockets at various points, and thus defeat one of its most important objects.

In compound fractures of the skull, with laceration of the dura as a complication, it is very important to close the primary wound after excising the bruised, mashed, and infected skin, bone and dural margins, and to make a new drainage opening one or two inches away from the point of compound fracture. This procedure will prevent many cases of hernia cerebri that otherwise are almost sure to occur in case every particle of infected material has not been removed during the disinfection.

There is one other reason, besides the possibility of sepsis, why primary drainage should be very thorough, and I am afraid it is a consideration which is too often lost sight of. I refer to fermentation fever, or

so-called primary wound fever, which I am sure is a common cause of death in severe compound fractures in that it causes secondary shock. We all like to see a reasonable amount of fermentation fever in compound fractures, as it is an evidence of the resisting power of the patient, but fermentation fever can be so excessive as to actually cause death. This excessive fermentation fever I am sure can be prevented in many cases if the wounded tissues are not unnecessarily manipulated, if at the primary dressing too great an attempt is not made to repair the lacerated tissues, and if the wound is left wide open and thoroughly drained.

The term thorough drainage may mean so many different things to different surgeons that I would like to explain what I mean by it in these cases. The majority of compound fractures that have come under my care left the operating table after their primary dressing with larger skin wounds than they had when they went upon the operating table. The larger my experience has gotten, the fewer stitches I have applied in these cases, and the more pockets I have obliterated by cutting through the overlying skin.

We now come to the question of immobilization, and this is the problem which requires the greatest amount of ingenuity, because no textbook or even treatise or system can be so complete as to give directions in regard to the kind of splint or immobilizing apparatus which should be used in every conceivable contingency. No two cases are alike, and the different complications and consequent varying requirements are practically innumerable.

As in simple fractures, our aim must be to get the fractured ends in proper relation to each other, and to hold them in this position until union has taken place; in compound fractures we must, in addition, secure opportunity for drainage. All this must be accomplished without undue discomfort to the patient. In compound fractures this is usually difficult and sometimes impossible, but with good judgment and perseverance it can usually be satisfactorily solved.

To enumerate and describe the different kinds of material and splints that have been used for compound fractures would require pages and pages, and is beyond our purpose and time limit. Any splint which fulfills the above requirements, no matter what it is made of, or how it is applied, is the one to use in the individual case. To get the ends in apposition and to hold them there is usually the less difficult part of the problem, but to so apply the splint that the wound can be inspected and dressed without disturbing the retention apparatus, to have it so arranged that the wound secretions can find exit without soiling the permanent dressings, is often a very difficult matter, and yet the more perfectly we solve this problem the more satisfactory our results will be. If we can so plan our method of treatment that the splint which we apply at the primary dressing will not have to be disturbed until bony union has taken place, we will have done much for the patient. The frequent changing of the splint in compound fractures has many serious objections. In the first place, it is apt to disarrange the proper apposition, and as a result one of two things is likely to happen: either there will be

so much displacement as to result in non-union, or if the displacement is not so great an excessive amount of callus will develop, which is apt to cause inclusion of nerve trunks and interference with circulation. In the second place, it causes the patient a great deal of suffering. This sometimes saps the vitality of the patient to such an extent that he is unable to withstand the concomitant sepsis. It causes an additional trauma to the already devitalized tissues, and consequently facilitates absorption of septic material. In a robust individual these things may not make any great difference as to the ultimate result, but in a very delicate individual, or one whose strength has been greatly impaired by the accident, it may be just the one thing that will be too much for the patient to bear. It is not an uncommon thing to see one of these patients come from the dressing-room utterly exhausted, and it is surely well worth our while to try to eliminate this evil whenever we possibly can.

In compound fractures of the lower two-thirds of the femur, in which plaster-of-Paris dressing will often not hold the fragments in good apposition, I have found the pneumatic splint quite satisfactory. In other compound fractures in which a fenestrated plaster-of-Paris dressing can be employed I have found the method recommended by Dr. Hugh Crouse, of El Paso, Texas, very useful. It consists of the following procedure: When the wound has been properly disinfected and the fracture ends are in good apposition, a small sterile dressing covering the wound and the surrounding skin for an inch or two in every direction is applied. Then the remaining portion of the limb that it is intended to encase in the plaster-of-Paris splint is wrapped in cotton and covered by a bandage and the plaster dressing applied in the usual manner, strengthening it as required with wood, steel, or wire strips. The fenestrum is then made, and the small dressing covering the wound is removed. A piece of sterile gauze of several thicknesses is now cut so as to overlap the wound edges a little, the exposed skin is carefully dried with ether and sterile gauze, and then the preparation, which I will describe directly, is carefully packed between the limb and the cast.

The preparation or mixture is secured by dissolving small pieces of Sampson's or any other good dental crown rubber in commercial chloroform, using sufficient of the rubber to make a semifluid, mucilaginous paste. Into this small pieces of lamb's wool are cut, and it is now applied as above directed. In this way an impervious dam is constructed which thoroughly protects the cast against any soiling.

This dressing has only one objection: in little children with sensitive skins the chloroform sometimes causes considerable burning. My associate, Dr. Abelmann, substituted for the rubber chloroform mixture a mixture consisting of celluloid dissolved in 30 parts of alcohol and 70 parts washed ether. To this the finely cut lamb's wool is added and the whole mixture is packed in in the same manner as the rubber chloroform mixture. This dressing can be applied without causing the slightest amount of pain and is nearly as good a watershed as the other.

The question as to what simple fractures it is desirable to primarily treat by suture and thus virtually intentionally make them compound is

one which is brought to the attention of the medical profession frequently. Personally I have followed this rule: If I am unable to secure reasonable apposition by the means at my command or if I have reason to believe that some soft tissue is interposed between the fractured ends I do not hesitate to cut down upon a fracture and suture the ends with chromic catgut. I have practically adopted this method in all fractures of the patella and the olecranon, because in these fractures perfectly satisfactory apposition without the use of sutures is rarely if ever possible. In fractures of the long bones I have found it necessary to resort to this procedure only on a few occasions, as in the great majority of cases I have been able to secure satisfactory apposition by simpler means.

2106 Sedgwick Street.

THE NEW PURE FOOD CATSUP: OR, WHEN IS A CHEMICAL NOT A CHEMICAL?*

J. A. Wesener, Ph.C., M.D.
CHICAGO.

The preserving of foods for future use has been practiced by mankind from early times. The methods which have been used for this purpose have been such as drying fruits and meats to remove the excess of water and the adding of substances to them by external application, such as smoke, salt, saltpeter and other substances as in the preparation of meats by drying, smoking and pickling. The use of vinegar and spices in the preparation of foods and relishes for the table has been practiced a considerable time. The purpose of these materials was to act as a preservative to the other ingredients of the food product as well as to improve its flavor because of their condimental value. In the preservation of food by the use of smoke there are introduced products which, when separated in the process of destructive distillation, are highly poisonous, and when taken in the concentrated form by man produce death. These substances include phenol and cresol and others of like character.

Salt, although constantly used in the preparation of all foods, and found to be an absolute necessity, is a preservative when used in excessive quantities and was probably the earliest preservative in the preparation of such substances as meats and fish.

The use of saltpeter followed later and was, and is now, extensively used in the preservation of meats, such as corned beef, ham and a long list of other products which are now put upon the market by the large packing concerns. The preserving action of saltpeter probably depends upon the change of the nitrate radical to the nitrite. At least this change always occurs during the process of preserving of meats by the use of saltpeter. The red coloring matter which is imparted to corn beef, ham, etc., is brought about by the presence of nitrite reacting on the coloring matter of the meat.

---

* Read in a Symposium on Pure Foods before the Chicago Medical Society, Nov. 10, 1909.

Sugar is found as a natural preservative in such substances as dried raisins and other dried fruits and is extensively used in the preservation of fruits and jams of all kinds. It requires the presence of considerable sugar to bring about the complete preservation of the material, but lesser quantities contribute largely to this end, although complete fermentation and putrefaction is not prevented by it.

Vinegar has been used as an article of food from early times. It is used for two reasons; first, on account of its sour and agreeable flavor, and, second, because of its preserving action.

Spices were in use in biblical times and they are extensively used not only for improving the flavor of foodstuffs, but as assisting in preserving them against fermentation and putrefaction.

TOMATO CATSUP.

Before going into the general discussion of the preparation of catsup, I wish to announce that I am not now, nor have I ever been, retained by any company that sells preservatives, and that the only interest I take in this matter is a purely scientific one, and I am writing from that standpoint alone.

Catsup is a name given to several kinds of sauces much used as a relish. It is made of several different substances, but the catsup most common to most markets of this country is tomato catsup, which is now so common that no table is considered complete without it. Although the tomato is supposed to be a native of America, it first found its use as an article of food from seeds which were brought from Europe. The plant was long cultivated as a curiosity before it was accepted as a food. Many were under the impression that, belonging to the night-shade family. it must possess poisonous properties. Of late the use of it as a garden vegetable has been gradually growing, and it is now perhaps one of the most common vegetables grown. Various methods of preparing this article for food are now common. It may be eaten raw, or it may be cooked and eaten direct or canned. One of its largest uses is in the preparation of catsup.

Catsup was formerly prepared solely by the housewife. The tomato was recognized by her as one of the most difficult substances to preserve, and there is hardly a person living who does not have some reminiscences of explosions which have occurred in the cellar by the fermentation of this variety of vegetable. The common way of preserving the catsup by the housewife was by the use of sugar, vinegar and spices, then boiled and concentrated. The containers which were used were usually bottles, and these were filled and hermetically sealed while the finished product was still hot. They were then placed on shelves in the cellar. If no fermentations and explosions took place, the product was correctly made, and the housewife would then tell her neighbor the good luck she had with the catsup she made that fall. In case the product did ferment, bottles which showed this action were again worked over by boiling, more sugar, vinegar and spices added, and then rebottled. Although the first preparation of the tomato catsup retained little, if any, of the tomato flavor, the second treatment of the fermented product removed any sug-

gestion of the original flavor of the tomato. The concentration of people in large cities where they were no longer able to produce their own tomatoes and make their own catsup called for the manufacture of this product on a larger scale by those who could devote a great part of their time and attention to it and arrange for the distribution to each household according to its needs.

On account of the element of luck which was always present in the household way of preserving catsup the manufacturer, by the aid of science, worked out a method which overcame all of the so-called luck in the preparation of this material. This was absolutely necessary to meet the new economic conditions which had arisen. This product had to be shipped long distances and remain on the shelf for months and years before it could reach the consumer. Any defects in its preparation entailed on him serious loss aside from the danger of deleterious effect on the consumer from eating fermented and decomposed food. Catsup prepared by this latter process has numerous advantages. Aside from that of more thorough preservation, it retains much of the original tomato flavor. It is thinner and more conveniently removed from the container and is commonly eaten by spreading it on the bread.

The essential point in this new method of preserving catsup was to introduce into it substances which assist in its preparation without in any way reducing or injuring its quality or without adding any deleterious substance to the product itself. A natural preservative which is found extensively in Nature and which contributes to the long keeping of fruits, such as cranberries, plums and some berries common to the old world, is benzoic acid, and what should be more natural than for intelligent business men and men of science to look to a preservative of this character to meet the special requirements which they found in the preparation of tomato catsup.

THE NEW PURE FOOD CATSUP.

The new pure food catsup which is a step backwards in the art of manufacturing this product came about by the attack of the United States Department of Agriculture upon the use of benzoate of soda in the preparation of foodstuffs. Excluding this article from use in the manufacture of catsup, it was necessary to substitute other preservatives in its place, as otherwise it would be impossible to preserve this product. Sugar and tomatoes are prone to readily ferment, and the result of their combination in the presence of bacteria is like the adding of fire to gunpowder, an explosion.

The manufacturer, then, to preserve this new pure food catsup, was obliged to, first of all, change his formula, thereby changing the flavor and character of the product upon which he had spent millions of dollars in advertising and establishing a well-earned reputation. If the particular brand of catsup which the manufacturer was putting on the market was of the sour and spice type it was very easy for him to preserve this catsup by the use of excess of vinegar and spices and without the use of any benzoic acid. If, on the other hand, the brand of catsup was of the sweet type and which, by the way, is the most preferred by

the consumer, the addition of an excess of vinegar and spices called for an excess of sugar in order to disguise to the taste the excess of spices and vinegar, and this method spoiled the delicate flavor of the catsup, which flavor is retained in catsup preserved with benzoic acid. For it is well known that benzoate of soda and benzoic acid have no flavor and do not in any way modify the flavor in which they are used. The present way of preserving the new pure food catsup is by either the use of an excess of vinegar and spices and then boiled down to a greater density than where benzoic acid is used; or by the addition of an excess of vinegar and essential oils and fluid extract of capsicum. The essential oils and fluid extract of capsicum are added last when the product has been boiled down to its proper density to avoid volitilizing the essential oils.

Within the past three or four years I have made extensive experiments in the preservation of catsup without the use of benzoate of soda or benzoic acid. I have found that where the catsup was sufficiently concentrated with an excess of spices, the product would keep well, although as already stated, the tomato flavor was almost entirely disguised by the excess of aromatics and vinegar. I also found that the product could be better preserved by the use of the essential oils, excess of vinegar and fluid extract of capsicum, the latter being especially beneficial as a preservative. Catsup preserved in this manner is much darker in color and the product preserved by the use of the essential oils and fluid extract of capsicum usually shows quite a discoloration in the neck of the bottle. If you should find this condition in catsup brought upon your table you could readily surmise the cause and your conclusions will be well strengthened by the spicy taste of the product.

PRESERVATIVE EFFECT OF BENZOIC ACID.

The preserving action of benzoic acid has long been recognized, and it has been found that this material in even very small quantities amounting to less than .05 per cent. is effectual in checking fermentation and even destroying many forms of bacteria. The substance is usually added to food stuff in the form of benzoate of soda, which is more soluble in water and which is speedily decomposed by the natural acid of the tomatoes.

The medicinal dose of benzoic acid as specified by the United States Pharmacopeia is 7½ grains and for benzoate of soda it is twice this amount, or 15 grains. It may be stated in this connection that it is a tendency of the United States Pharmacopeia to give the medicinal dose near the low limit rather than the high. The United States Dispensatory gives the dose of benzoic acid as 30 grains, and states that for benzoate of soda from 60 to 120 grains may be given in divided doses during the day. In this connection, it will be of interest to compare the dose of essential oils, fluid extract of capsicum and acetic acid (vinegar) with that of benzoic acid and benzoate of soda. The medicinal doses as given by the United States Pharmacopeia are as follows:

For cloves, 4 grains each; for coriander, nutmeg and black pepper, 7½ grains each; for allspice and caraway, 15 grains, while for the essen-

tial oils of these aromatics the dose for oil of cloves, caraway, coriander, nutmeg and allspice is 3 minims, or practically 3 grains, while the dose of cinnamon is less than one grain. The dose of the fluid extract of capsicum is also less than one grain. It will at once be seen that the dose of all these substances is very much less than that of either benzoic acid or benzoate of soda. The dose of dilute acetic acid containing only 6 per cent. by weight of acetic acid is 30 drops, or practically 30 grains. When we calculate this to the actual amount of acetic acid which is present in this diluted acetic acid we have practically 2 grains as the dose of pure acetic acid, and the precautions are always given in books in prescribing this medicine that it should be diluted with water, and the pure acetic acid sold by the drug store must bear the red label of the skull and cross bones and be marked "poison." The maximum dose of benzoic acid is given in the Pharmacopeia as nearly four times as great as that of acetic acid.

Now, as to the preserving action of acetic acid, Sternberg states that a solution of one part of glacial acetic acid to 300 destroys the cholera spirillum in one-half hour. In the proportion of 0.25 per cent. it restrains the growth of typhoid bacillus and in 0.3 per cent. destroys its vitality after three hours' exposure. And, on the strength of another authority, he states that the cholera spirillum fails to grow in the presence of 0.132 per cent., and is destroyed by 0.2 per cent. acetic acid. From the data given in this work the antiseptic properties of acetic acid are found to be greater than those of boric acid and salicylic acid and one-third as great as benzoic acid. From the formula used by some large manufacturers of catsup we are enabled to calculate that the amount of acetic acid added is somewhat in excess of 1 per cent. of the finished product. It is well recognized that there are some acid-resisting bacteria that will grow even in the presence of much acetic acid, and to completely preserve the catsup it is necessary to add other antiseptic substances. A person consuming an ounce of catsup containing this amount of acetic acid would receive practically 4.6 grains of pure acetic acid, or more than twice the medicinal dose as given in the United States Pharmacopeia, whereas if he were using an ounce of catsup preserved with benzoic acid he would consume only one-twelfth of this amount of benzoic acid or practically 1/20 of the medicinal dose of this latter article. Taking the combined medicinal doses of the essential oils used in preparing catsup and necessary to complete the preservation of it, we find it necessary to use an amount of this substance only a little less than is required of the benzoic acid, notwithstanding that the medicinal dose of these substances, as has already been shown, is less than one-half, and in the case of the oil of cinnamon and the fluid extract of capsicum hardly more than 1/10 as great as the medicinal dose of benzoic acid.

A recent bulletin of the United States Department of Agriculture Bureau of Chemistry, Bulletin No. 119, recommended for publication by Dr. H. W. Wiley, Chief, gives results of experimental work carried on by Mr. A. W. Bitting, an inspector of the Bureau of Chemistry. This bulletin states that the regular catsup used in their experiments and evi-

dently recommended for manufacture, referred to the pulp of only ripe tomatoes to which was added granulated sugar, 80 grain distilled vinegar, table salt, onions, garlic, whole cinnamon, cloves, mace and ground cayenne pepper, and that other catsups were made in a similar manner by substituting for these whole aromatics the essential oils and also the acetic acid extracts from same to give the same strength as with ground spices. The bulletin does not give the amounts of these various ingredients that were used, but it does state on page 27 that each manufacturer must work out the quantities that could be used in his formula and still retain the character of his goods, implying that in the administration of the pure food law no exception will be taken to any quantity of these ingredients which the manufacturer might see fit to put in. It is stated further, on page 26, that with the increase in vinegar it is necessary to add sugar and slightly more spices to overcome the pungency of the acid and thus insure good flavor, and we might add, "good preserving." The authorities here do not appear to see any connection between that paragraph in the Pure Food Law, which states that an article shall be deemed to be adulterated "if it be mixed, colored, powdered, coated or stained in a manner whereby damage or inferiority is concealed," nor to the Food Inspection Decision No. 66, which refers to the use of sugar in canned foods. In this bulletin attention is called to the clause just quoted, using it as a basis for restricting the use of sugar to sweeten canned corn and other vegetables. It is there stated that it is held "that the addition of sugar to a substance not naturally sweet, converting it into a substance which might seem naturally sweet, is justified if the label plainly indicates that this sweetening material is added."

The antiseptic properties of essential oils are thoroughly recognized by the medical profession and have been used by them in the treatment of diseases, especially in those cases where it is desired to check fermentation, as in case of flatulency. The essential oils of cloves and allspice contain large quantities of eugenol, and the United States Pharmacopeia states that the essential oil of cloves must contain not less than 80 per cent. and allspice not less than 65 per cent. of this same body. Eugenol, according to the United States Pharmacopeia, is an unsaturated aromatic phenol (carbolic acid) obtained from oil of cloves and other sources. It is a well-recognized antiseptic, and the United States Dispensatory states that it probably resembles carbolic acid in its physiologic action. Some authorities have gone so far as to assert that eugenol is a more powerful antiseptic than carbolic acid.

Oil of cinnamon contains much cinnamic aldehyd and may contain cinnamic acid. Cinnamic aldehyd is readily oxidized to cinnamic acid on exposure to air, a condition which very nearly always occurs when a bottle of catsup is opened and kept in the household. Cinnamic acid was at one time used largely in the treatment of tuberculosis. It is well known that the chemical formula of cinnamic acid is closely related to that of benzoic acid and cinnamic acid is prepared synthetically from benzoic aldehyde. Decomposition products of these two substances in the body are known to be practically identical and both produce hippuric acid. In

addition to this, it has been found that cinnamic acid has marked bactericidal properties, especially when used in connection with certain fruit acids, as tartaric acid. Powdered capsicum and fluid extract of capsicum are powerful irritants, and are always taken in very small doses.

It will be seen from the chemistry as I have outlined here, that spices, their essential oils and other preparations from them, vinegar, or the acid which it contains, which is now the one always specified in the Pharmacopeia for making medicinal preparations containing acetic acid, are all properly classed as chemicals, and the active principle of each bears a definite chemical formula. If there were in Nature substances from which benzoic acid could be obtained in sufficient quantity to be used in the preparation of catsup, it could as well be added in this form as in the form of the refined product as it is commonly obtained in the markets. The wide distribution of benzoic acid in foodstuffs and in the animal body is well established. It is found as benzoic acid and in the form of derivatives. In the vegetable kingdom, the family of the palms produces a natural exudation known as dragon's blood and is similar to the gum obtained from the benzoin tree. The family of grasses also contains this acid or its representatives. Benzoic acid has been identified in sweet vernal grass and has been found in the meadow soft grass. It is present in what the Germans call the Waldmeister, a plant which is used in the flavoring of certain beverages in the old country. It is found in the congener of our cranberry, the German preisselbeere which is used extensively as a relish in Germany. The preisselbeere, like the American cranberry, has a capacity for remaining in good condition for a relatively long time. Naegle was the first to call attention to the antiseptic properties of the substance contained in the preisselbeere. The American cranberry contains of benzoic acid, according to W. D. Bigelow of the United States Department of Agriculture, between 210 and 430 milligrams in 1 kilogram, or a trifle less than what is permitted in the preparation of catsup. It is also found in sweet clover and in the fruit known as St. John's bread, which is occasionally eaten by children in this country, but which serves as a more important article of diet in some oriental countries.

Cranberry sauce, which is the side dish at all Thanksgiving Day dinners, and is extensively used at other times of the year, is especially rich in benzoic acid. We consume considerably more benzoic acid at one meal partaking of cranberry sauce than we would obtain from the taking of catsup as catsup is usually eaten. It matters not what we eat, there are always present products which are changed into benzoic acid, and during the twenty-four hours probably 1 to 10 grains of benzoic acid is produced in the small intestine and is derived directly from the food which is consumed. The benzoic acid thus produced is dissolved and carried through the tissues of the body, finally reaching the kidney and eliminated as hippuric acid. The urine from the grass-eating animals is very rich in hippuric acid, whereas that of man is rich in urea. On account of the wide distribution of benzoic acid in both the vegetable and animal kingdom, it seems the height of absurdity to say that because 0.05

to 0.1 of 1 per cent. of benzoic acid when added to a product is poisonous because man in that case did the adding, whereas, on the other hand, if the benzoic acid or its derivatives exist naturally in the foodstuff, it is then considered harmless and the product in which it is eaten perfectly wholesome.

Catsup preserved by benzoic acid usually contains much less spices and vinegar, is far more wholesome and better for the well-being of man than the catsup made in the old-fashioned way, which was exceedingly spicy; or the new pure food catsup of to-day which is preserved either by an excess of spices and vinegar or by the use of essential oils, vinegar and fluid extract of capsicum. For my part, I would rather drink a pint of sweet catsup preserved by benzoic acid than I would two ounces of the so-called pure food catsup, and I am certain that if any disagreeable disturbances were manifested, it would be due to the malic acid naturally present in the tomato, and not to any benzoate. On the other hand, I am quite certain that the dose of the preservatives in the two ounces of the pure food catsup would produce more marked physiologic disturbance than would the benzoate that would be obtained from the pint of sweet catsup. These are all chemicals, no matter whether we eat the chemical in the form of powdered cloves, cinnamon and capsicum and vinegar, or in the form of the chemically purified product obtained from these. The only difference is that one is the crude and the other is the refined. Unfortunately, it is this latter fact which the poor buncoed American public has not been made to understand by those who have had selfish motives. I might add, that this buncombe has extended even to our own medical profession which recently condemned benzoate of soda and other preservatives in foodstuffs when there were probably not more than one or two in the entire assembly who understood the real purport of the resolution which they were passing, and this, too, in the face of the findings of the Referee Board, composed of some of the most able scientists in the country, who had been selected for their special qualifications to pass upon this subject and who had reported, as the result of careful investigations, that they find no harmful effect to come from the use of benzoate of soda, even in large doses, far in excess of any quantity that would ever be used in the preparation of food.

The report of the Referee Board was accepted and endorsed by the National Food and Dairy Commissioners, who were in convention in Denver, Aug. 24, 1909. The only condition which the opponents to the use of benzoic acid are still upholding, now that they have given up the deleterious claim, is that by the use of this product inferiority can be concealed and thereby deception practiced. Now, as a matter of fact, just the opposite is true. Benzoate of soda is an odorless and practically tasteless compound. I have made many experiments in the preservation of tomato pulp of all kinds and have found that rotten pulp can be preserved much more readily by the use of essential oils, spices and vinegar than by benzoic acid. That the benzoic acid will not cover up any of the odors produced from the decaying material, nor will it in any way change

the flavor. On the other hand, it is quite easy to disguise the flavor and odor of decaying tomatoes when the essential oils, spices and vinegar are properly used.

I have already stated that the benzoic acid catsup retains the delicate tomato flavor, whereas the essential oil and the fluid extract of capsicum catsup is mostly a flavor of spices and sour. Therefore, we see that benzoate will never disguise inferiority, whereas, by the old-fashined way, as mother used to make it, or by the more refined way where the active principles are used, inferiority can be easily covered up.

Professor Long also investigated this question as to whether or not inferiority could be disguised by the use of benzoic acid, and he found that this could not be done, but when working on the same rotten tomatoes and using vinegar and spices, he had no difficulty in disguising the inferiority, and he says: "Some of this was preserved with vinegar and spices, some with benzoic acid and some was left unmixed. The odor and taste of the last was bad. That with the benzoate essentially the same, while with the vinegar and spices a fair grade of commercial catsup was secured. A worse lot of raw material could not be imagined, yet the inferiority in the one batch of product was completely concealed by the use of the vinegar and spices, and this is a perfectly logical result."

In summing up this paper I wish to emphasize:

1. That benzoate and benzoic acid are medicinally less active than the others used in the preservation of food and that the benzoate is less active than the preservatives now used in making the pure food catsup, which it has been stated may be made without the use of chemicals.

2. By the use of benzoate and benzoic acid, the flavor of the article preserved is not lost nor can any inferiority of the product be disguised.

3. The flavor produced by vinegar and spices is wholly artificial and does not retain much of the natural flavor of the product that is preserved. By this it is easy to cover up inferiority and thereby deceive the consumer.

4. Changed conditions in economics have made it imperative for the manufacturer to prepare his food to reach the consumer in a sweet, wholesome and palatable state. Benzoate and benzoic acid for catsup does this far better and in a less injurious manner than the products that are now used and so extensively advertised in the manufacture of the pure food catsup.

It will readily be seen why I chose this subject and stated it in such a ludicrous sense, "The New Pure Food Catsup: or, When is a Chemical Not a Chemical?"

103 State Street.

THE PRESERVATION OF MEATS BY COLD STORAGE.*

PROF. H. S. GRINDLEY.
University of Illinois

The proper preservation of our food products from the time they leave the producer or manufacturer until the time they are required by the consumer is constantly becoming a more difficult and a more important problem as the quantitative and qualitative demands of our rapidly increasing urban population grow and the cost of living constantly and rapidly increases. This question of the proper preservation of food products is one of much interest and, indeed, of vital importance to the medical profession. It is also a topic of fundamental importance to the producer, to the consumer, and to the manufacturer.

The interest of this question to the medical profession centers mainly around the numerous questions relating to the proper nutrition of man in health and in disease, and to the conservation and the protection of the health of the people. Even casual observation and superficial study reveals the fact that as yet we have but little well-defined, exact, scientific knowledge of the numerous processes and activities which have to do with human nutrition. As yet practically nothing is known as to the important and vital problems involved in the proper economic and scientific nutrition of man. While we should properly appreciate and frankly acknowledge the fact that all of our scientific knowledge of nutrition is fragmentary, we should at the same time be grateful that it is rapidly increasing.

I was requested by your secretary to speak to you this evening upon one phase of the preservation of foods, namely, "The Preservation of Meats by Cold Storage." The investigations which have been made at the University of Illinois upon the effect of cold storage upon meats were begun in 1904 with the prime object of determining the character of the chemical changes which meats undergo when kept in cold storage. Investigations of this nature were necessary in order for us to continue researches upon the chemistry of flesh which were begun as far back as 1895. In the year 1904 it became necessary for us to undertake investigations to determine the influence of feed, of age, of breed, of sex and of other factors upon the chemical composition of the animal body. To do this it was desirable to examine the eleven wholesale cuts of the entire half-carcasses of beef. This could only be done economically and in an effective manner by keeping the carcasses of beef in cold storage for periods varying from four to sixty days at least. The question then immediately arose, will the cuts of beef kept in cold storage for 10, 20, 30 or 40 days or even longer undergo any chemical changes whatever? Our object was not merely to determine whether or not meats kept in cold storage underwent any changes that were detrimental to health, but to determine accurately by the most delicate means now at our disposal whether or not meats kept in cold storage underwent any chemical changes of any kind whatsoever, from any cause whatever.

---

* Read in a Symposium on Pure Foods before the Chicago Medical Society, Nov. 10, 1909.

It should be clearly understood in the beginning that the meats which were placed in cold storage for our work came from animals which were killed, dressed and prepared for cold storage in the usual way, but under our own personal supervision. The meats thus prepared were immediately placed in cold storage under known conditions and constantly kept under such conditions until removed personally by ourselves and taken directly to the chemical laboratory for immediate examination. In other words, the meats were entirely fresh and as good as could be when placed in cold storage, and during their sojourn in cold storage they were kept constantly just as we desired; further, they were taken directly from cold storage to the chemical laboratory, there being no opportunity for changes from the time they left cold storage until used for our chemical examination.

Briefly stated, our investigations consisted of the following experiments:

1. The detailed chemical examination of four wholesale cuts of fresh beef from the left half of a one-and-one-half-year-old Hereford steer and of four wholesale cuts kept in cold storage for twenty-two days. These four cold storage cuts came from the right half of the same Hereford steer from which the four fresh cuts were taken from the left half.

2. The detailed chemical examination of two wholesale cuts of fresh beef from the left side of a one-year-old Durham steer and of two wholesale cuts kept in cold storage for forty-three days. The two cold storage cuts came from the right half of the same Durham steer from which the two fresh cuts were taken from the left half.

3. Cold storage, frozen, drawn poultry was compared with undrawn fowl similarly prepared and kept, and, further, fresh unstored poultry was compared with drawn and undrawn frozen fowl. In this connection the detailed chemical examinations of one sample of fresh chicken, two samples of undrawn cold storage chicken and two samples of drawn cold storage chicken were made. Nothing was known as to the kind of poultry, or as to their feed. The chickens were killed, dressed and packed for cold storage by a large wholesale firm in Chicago, under my direction and continuous supervision. The same day that the poultry was killed and dressed it was placed in one of the large cold storage warehouses in Chicago and immediately frozen. The poultry was maintained at a temperature of 10° F. during storage. The fact should be noted that the supply of poultry used in our investigation was immediately placed in cold storage after it was killed and dressed. In other words, the dressed poultry was not allowed to stand, nor was it shipped from outlying districts after being killed and before being placed in storage.

4. In connection with this investigation upon the influence of cold storage upon uncooked beef and poultry, it was thought that it would be of economic and scientific interest to make several cooking experiments upon some of the fresh and refrigerated uncooked samples and thereby to ascertain what influence, if any, the cooked meats might show over the uncooked, as to changes brought about during cold storage. It could easily be assumed that the process of refrigeration would produce not

only chemical but also physical changes in the meats which might not be apparent upon simply analyzing the uncooked product, but would be brought out more distinctly by analyzing the cooked samples and the resulting broths and drippings. With this object in view, both boiling and roasting experiments were made upon portions of the same samples of the uncooked loin cuts. In this connection the detailed chemical examination of eight samples of cooked meat and eight samples of broth and drippings resulting from the boiling and the roasting were made.

Even if it were desirable, it would be impossible to give this evening, in detail, the complete data of this investigation or to discuss in detail the results which have been obtained. If there is anyone present who would care to study the detailed data and the discussion of the same in full, they will find them in *The Journal of Industrial and Engineering Chemistry,* vol. i, pages 413 to 436 and 580 to 597. I also have here a few reprints which may be passed around for inspection. I have placed a brief index upon the covers which will assist you in finding the most essential tables.

I now desire to state briefly but clearly the facts which this investigation, together with the study of other investigators in this field, have taught regarding the topic under discussion.

1. Theories and mere statements unaccompanied by experimental data or facts upon the effect and value of cold storage upon meats are numerous, but accurate and scientific studies of the various aspects of the problem have so far been comparatively few. In such matters as this which relate to conditions which may or may not fundamentally affect the health of our people, it is more than useless, in fact it is an injustice to the consumer, the producer, and the manufacturer, to express upon either side of the question mere personal opinions unaccompanied by experimental data. It is necessary in such questions to very carefully distinguish between mere circumstantial evidence which is worthless and direct experimental evidence which is of untold value in this connection. In other words, we should be influenced only by the exact facts in the case, by the true findings of careful study of the entire question.

2. Thorough, accurate and exhaustive chemical investigations in this country by Wiley and Pennington and their associates, and Richardson and Scherubel, and Emmett and Grindley, have demonstrated without doubt that properly cold storage meats are as nutritive as fresh meats, considered from the standpoint of their chemical composition, and that meats kept in cold storage under proper conditions undergo at most only very slight chemical changes. The work of Rideal in England, of Gautier in France, and of Mai, Grassman and Müller in Germany fully agree with the work of the above-mentioned American investigators.

In fact, so far as I have been able to find, there have been no chemical studies made upon this subject which in any way contradicts the above conclusions. In other words, the records of all investigations so far made upon this subject leads to the conclusion that properly refrigerated meats are as nutritive and healthful as fresh meats, judging from the chemical composition, the digestibility and the cooking qualities of the

same as determined by the exact, accurate, experimental findings of the science of chemistry. I think it is not necessary from now on to make mere chemical investigations alone and by themselves, to determine the effect of cold storage upon flesh. Of course, it will be desirable and necessary to make careful chemical studies in connection with the bacteriologic and nutritional investigations which are still very necessary in this connection.

3. It is not as yet easy to draw well-defined, definite conclusions from the bacteriologic work which has been done in this connection. The careful and exhaustive work of W. F. Boas, M.D., of the Massachusetts State Board of Health, conclusively demonstrates that ptomaines or toxic principles are not produced in either drawn or undrawn poultry during proper cold storage. Dr. Pennington of the Bureau of Chemistry of the U. S. Department of Agriculture, in her investigations, has found positive evidence of bacterial growth during the storage period. The reduced temperature retarded the growth of the bacteria, but it did not destroy the organisms. The bacterial study of poultry gave evidence of the presence of an appreciable number of bacteria in the edible stored flesh, but none in the fresh samples. Richardson and Scherubel, in bacteriologic work, found that in the freezing of the meat the bacteria became surrounded by solid barriers of ice through which they could not penetrate and hence they cease to grow. In their chemical work there appeared to be no general tendency for the ammoniacal, the coagulable, or the albumose nitrogen to increase or decrease, and hence chemically the products of bacterial growth, if there were any, were inappreciable.

Further, bacteriologic investigations in a study of the influence of cold storage upon meats are needed. However, I understand that the Bureau of Chemistry of the U. S. Department of Agriculture has made during the last two or three years extensive investigations in this field, and it is more than probable that the publication of the results of this Bureau will give the data necessary to clear up the somewhat contradictory and negative results now on record as to the bacteriologic questions relating to the preservation of meats by cold storage.

4. There should be high-grade inspection of cold storage products, as all other food products, before they reach the consumer. To-day it is evident to all that it is undoubtedly necessary that food products of all kinds should be subject to thorough, careful, intelligent and proper inspection before they reach the table of the consumer.

5. Other investigations are much needed in order to definitely and beyond doubt prove whether cold storage meats are or are not as healthful, nutritive and hygienic as fresh meats. I am convinced that the best method of definitely and conclusively arriving at information of direct value upon the question of the nutritive and hygienic condition of meats and other food products after various periods of holding in cold storage under the usual commercial methods, in a practical and scientific manner, is the determination of the influence of such cold storage products upon the normal health, strength and vigor of healthy men, when these products are consumed in considerable quantities for a somewhat

extended period. Such determinations can be made with exact scientific accuracy and under conditions which would have been a very close approximation to the ordinary, actual, normal conditions attending the consumption of cold storage products.

Briefly stated, the methods which would be followed in such an experiment are as follows: A group of twenty-four able-bodied men would be selected as subjects of the experiment which would extend over a period of ten to twelve months at least. The men forming the squad would be housed and boarded under conditions quite similar to those of a well-organized club or fraternity. In all cases the foods would be served in the usual manner and in their usual conditions, but each kind of food would be weighed and served individually to each member of the club. A varied and mixed diet, consisting of fruits, cereals, vegetables, soups, meats, bread, milk, butter, etc., would be supplied the members of the club. After preliminary tests, the squad of twenty-four men would be divided into two groups, each group consisting of twelve individuals. Group I would be given the ordinary diet mentioned above, but the members of this group would be served fresh meats exclusively. Group II would be given exactly the same diet as mentioned above in Group I except that members of this group would be served cold storage meats either exclusively or in part. A very complete daily record of the physical condition of these two groups of men would be kept. Thoroughly competent physicians would keep daily records of the physical condition and the health of each individual of the squad. At the same time all liquid and solid excreta from each individual of the squad would be accurately weighed and completely and exhaustively examined chemically, microscopically, clinically, and bacteriologically.

A thoroughly devised and planned investigation along the lines above indicated which was conducted in a careful, exhaustive, practical and scientific manner in all details would lead to results of a conclusive and final character as to the nutritive value and the sanitary condition of meats after various periods of holding in cold storage under the usual commercial methods.

However, there should be carried on, hand in hand with the above line of investigation, thorough, painstaking and elaborate studies in the following lines relating to the subject:

1. A thorough study of the nature, the number, and the kind of bacteria which are found in cold storage meat products as compared with the nature, the number, and the character of the bacteria which are found in similar fresh products as they are offered for sale upon the open market under the usual and normal conditions.

2. The same researches would include a thorough and exhaustive research to demonstrate clearly by the most improved, scientific and practical methods known to-day, whether or not proper cold storage food products under any conditions contain decomposition products of a ptomaine nature.

3. In this connection, thoroughly planned and devised researches should be undertaken along practical and scientific lines to experimen-

tally demonstrate unmistakably to all the most suitable conditions of temperature, time, the proper methods of preparation for storage and the best and most economical methods to use in order to give the best possible results as to the healthfulness, nutritive value, palatability, flavor, and digestibility of the various meat products which have been preserved by cold storage.

THE ENACTMENT OF FOOD LAWS, THEIR ENFORCEMENT AND EFFECT.*

THOMAS E. LANNEN, ESQ.
CHICAGO.

The subject of food laws, and their enforcement and effect, is one of such a scope and magnitude that it is very hard to confine a paper like this to any reasonable bounds and cover the field, even in part. It is a matter in which one is not troubled so much for something to say as troubled about what to say out of all that might be said. I shall try to cover briefly the salient points of the subject.

The food laws of the several states are passed by the state legislatures in the exercise of the police powers of the states. The police power of a state may be said to be the power of a state to legislate for the benefit of the public, and more particularly for the protection of public health, public morals or public safety. The police power of a state is one of the broadest powers it has. It is a power that cannot be definitely defined, and about the only limit that can be fixed for it is a limit of reasonableness. The constitution of the United States provides that no person shall be deprived of life, liberty or property without due process of law, but anything that is done by a reasonable exercise of the police powers of a state is done by due process of law. It is that great power of a state under which the rights of the individual must be surrendered for the benefit of the public welfare to the fullest extent consistent with reason, and the reasonableness may generally be determined by the necessity for the exercise of the power in whatever way it is exercised.

When we stop to consider these facts seriously, and consider that the state in passing and enforcing food laws is frequently encroaching on the rights, both personal rights and property rights, of the private citizen, for the benefit of the public, and without compensation or reward other than that a citizen may derive by being a part of the public, we can at once see how important and just it is that there be a real and not a fancied necessity for the exercise of this great power. We can also see how necessary it is that the men charged with the enforcement of such laws, and in whom is reposed by the public very great discretionary powers, shall be men of a broad caliber and men who carry around in their breasts a deep-seated love and thorough respect for the republican

* Read in a Symposium on Pure Foods before the Chicago Medical Society, Nov. 10, 1909.

form of government under which we live. Indeed, it is even necessary that they understand our form of government, and always remember that if you destroy the private citizens of this country there will be no public left.

We boast of our private rights in America, and justly so. It is one of the few countries on the face of the earth where even the executive head, even in public affairs, says "I" and "My;" but there are officials in our land to-day who have so far absorbed all that is public that I wonder often if they would not prefer to say "We" and "Our" in speaking of themselves.

In addition to the state food laws we have the National Food Law. But while the state food laws are passed as stated, under the police powers of the several states, the National Food Law is passed under a different power, namely, the power to regulate interstate commerce among the several states. Theoretically, and I believe strictly legally, the protection of the public health, public safety or public morals has nothing whatever to do with, and no connection with, the power of Congress to pass or the power of the government to enforce the National Food Law, and that law is simply a cold-blooded regulation of interstate commerce, and is valid, if at all, simply because Congress has the right to regulate interstate commerce for some given reason, or without giving any reason at all. The protection of the public health, public safety or public morals cannot be given as a reason for the validity of the National Food Law, because the people live in the several states and each state has the exclusive power to, and does, protect its own public health, public safety and public morals in accordance with the will of the people living in each state. Nobody lives in interstate commerce, it is simply a name given to that business which is transacted among the several states; consequently there is no public health, public morals or public safety to protect in interstate commerce. Furthermore, the government of the United States has no general police power, and it has no unwritten law, but acts entirely by statutory law; while the States proceed not only by statutory law, but also sometimes by unwritten law, which is commonly called the common law. In addition, the states have general police powers.

We have, therefore, two classes of food laws; that is to say the state food laws and the National Food Law.

A state food law applies to and regulates the manufacture and sale of all food products produced or sold within that state. It has no force or effect beyond the boundary line of the state.

The National Food Law applies to the manufacture and sale of food produced or sold in the District of Columbia and the territories of the United States to the same extent that a state law applies within a state. And in addition to this, broadly speaking, it applies to all foods shipped in interstate commerce or shipped in from a foreign country.

Every state in the Union has a food law, and there is some one charged with its enforcement and actively enforcing it in practically every one of the states.

Let us now consider for a moment what the food manufacturer has to contend with. I mean particularly the manufacturer who does business in a number of states, and nowadays all large food manufacturers do more or less business in practically all of the states. The laws of the several states are not uniform; that is to say, the laws of one state will not harmonize, in many instances, with the laws of the rest of the states; and sometimes the law of one state will not harmonize with the laws of the rest of the states or with the National Law.

Let us consider the position of a food manufacturer living in Chicago and doing business in a number of the states, or in all of the states. Let us suppose that he sells a carload of food to a wholesale grocer in the State of Iowa. That wholesale grocer is going to sell that food to retail grocers in Iowa and in the states surrounding Iowa. The Chicago manufacturer must first consider the National Law, because unless his goods comply with the National Law he cannot ship them to the wholesale grocer in Iowa. Having studied the National Law and determined how to manufacture and label his goods so that he can legally ship them from Chicago to Iowa, he must then consider the state food law of Iowa, because some of the goods will be sold in Iowa, under the Iowa food law, and if they are not legal under that food law the man selling them will be arrested and fined and he will come back on the Chicago manufacturer. Then the Chicago manufacturer, having determined how to make his goods and label them so that they will be legal to ship to Iowa, and legal to sell there, must then begin to consider the laws of the states surrounding Iowa, because the wholesale grocer in Iowa has an established trade in Minnesota, North and South Dakota, Nebraska, Kansas and Missouri. His trade may even extend into other states, but the manufacturer must at least figure that his trade extends into the surrounding states. Now let us see what he finds himself confronted with:

He finds that he can make an article of food that, under the National Food Law, is perfectly wholesome and legal and legally labeled, and which will also be deemed wholesome and legally labeled in the State of Iowa, and, in so far as those laws are concerned, will be held to be legal and pure in every respect. But this article of food may contain a coal-tar color, and, while it is deemed pure and wholesome while it is being shipped to Iowa, and as long as it remains in the State of Iowa, the moment that article of food crosses the line of Iowa and gets into Minnesota that harmless coal-tar color is deemed a poison and the food is held to be illegal and unwholesome in Minnesota and cannot be sold in that state. Or if it happens to stray into North Dakota the laws of that state transform the harmless color into a harmful one and it cannot be sold in North Dakota. But if it happened to get into South Dakota, or Nebraska, or Missouri, or Kansas, the color would still remain wholesome and the food would be held legal in those states in so far as the color is concerned. But let us consider that article of food in another respect. It may be a syrup and may not bear any statement of its weight or measure. Now, in so far as the National Food Law and the law of Iowa are concerned, it is a legal article of food. So, too, will it be legal if it gets

into Minnesota or South Dakota, or Missouri, or Kansas. But if it gets into Nebraska or North Dakota it will be illegal because it contains no statement of weight or measure. Or let us suppose that this article of food contains a small amount of benzoate of soda. In so far as the National Law is concerned it is wholesome and may be shipped. It is also wholesome in Iowa and may be sold there. It will still remain wholesome if it strays into Missouri, or into Nebraska, or into Kansas or into South Dakota. It seems the climates of those states will not affect the benzoate so as to make it injurious, and the laws of those states are not worded in such a way as to work a transformation of the benzoate and make it unwholesome in those states. If it gets into North Dakota and Minnesota it is not injurious to health simply because it happens to be in those states, or because of the laws of those states, but it depends upon what the article of food is. If the benzoate happens to be in a catsup or in crushed fruits for soda fountains in Minnesota it seems it is not injurious to health, but if it happens to be in a sweet pickle or anything else it seems it is, so that in Minnesota it seems the question as to whether the benzoate of soda is injurious or not must be determined by the identity of the food. The law itself does not make benzoate of soda injurious to health, or say that it is, in Minnesota. Neither does it say that it is not injurious to health in any article of food. But it says that anything which is injurious to health cannot be used in food. Therefore when we find that it is permissible to use it only in catsups and crushed foods for soda fountains the only conclusion we can reach is that it is not injurious to health when used in catsups and crushed fruits, provided, of course, the crushed fruits are going to be used at soda fountains. If the crushed fruits are going to be used anywhere else, or for any other purpose, the benzoate thereby evidently becomes injurious to health. And if it is used in any other foods it is injurious. We find practically the same condition of affairs in North Dakota. And, in passing, we might say that it seems this benzoate of soda is going to be injurious to health in Minnesota after Dec. 1, 1910, in the products in which it is not now injurious to health.

This is simply an illustration of some of the conditions that must be considered in shipping from Chicago to Iowa. There are many other points that I might raise in regard to such a shipment. The same conditions or others just as bad have to be considered in shipping food to any part of the United States. A manufacturer may ship to some part of the country where he will not be confronted with the preservative question or the color question, but still he may be up against the labeling question or some other one. It may be the size of the type or the form of his label or some other technicality. There is no assurance whatever that because a label is legal under the National Food Law that it will be legal in all the states; or because it is legal in one state that it will be legal in any other.

With this condition of affairs existing it becomes necessary for a food manufacturer who does business in all the states, or any number of them, to either become familiar with these laws himself, or employ an

expert who is familiar with these laws. This expert must be just as familiar with the food law of one state as with the food law of another, and he must have the whole food law situation of the United States in hand. He must, in addition to knowing what the law really means, know what the particular food commissioner of any state thinks the law means, because the commissioner is going to inform the trade of that state that the law means what he thinks it means, and if a manufacturer ships goods into that state that do not comply with the food commissioner's interpretation of the law of that state those goods will be singled out for attack and the manufacturer's trade will be intimidated until they refuse to handle the goods or until the manufacturer goes into the state and forces the issue with the commissioner and gets a court decision that will settle the point. Even then there will be a prejudice against his goods. In passing on labels for the various states a man must have a practical knowledge of food chemistry and conditions surrounding the manufacture of food, as well as the laws of the state, and he must also be familiar with trade conditions and customs. He must not only be an expert in interpreting the food laws of all of the states of the Union applying to foods and drinks, but he must also have a practical knowledge of the manufacture and composition of not one food, or one drink, but of all foods and all drinks. He must be, in other words, a sort of walking encyclopedia on everything that pertains to food and drink. And even with all this knowledge he is a very expert expert who can advise a food manufacturer how to sell articles of food in all of the states and have that food legal in all of the states and keep the food manufacturer out of trouble.

The food manufacturer nowadays is not only confronted with the question of how to label his product, and the question of what ingredients are injurious to health and what ones are not, but he is also confronted with the question of standards. The Secretary of Agriculture of the United States has promulgated a set of standards for food products as the official standards of the United States. These standards have not been incorporated into the National Food Law, nor have they been made legal standards by any act of Congress. By legal standards I mean standards that food manufacturers must, under penalty of law, abide by in manufacturing and labeling their food. The standards have simply been promulgated as the official standards of the United States, but the force and effect of the same has not yet been defined or established. About all we can say for them, in this respect, is that they are in existence. They were formulated by a committee of chemists. They are in many particulars wholly arbitrary standards; that is, they represent what the chemists formulating them thought the standards ought to be, regardless in many instances, of what the standards actually existing are and were when they formulated these standards. I regret that I have not the time to go into the history of these standards. In so far as the National Law is concerned, these standards are frequently referred to by the government officials and manufacturers are warned that their goods must conform to these standards, but the courts have already held that

these standards have no binding effect in law, in so far as the enforcement of the National Food Law is concerned.

But some of the state food officials seem to think that these standards have more force and effect in the several states than they have under the National Food Law. And here, again, is where the food manufacturer comes in for a world of trouble. There is only one state that I know of in which the legislature has legally adopted these standards, but nevertheless the food commissioners of a great number of states have boldly published these standards as the law in those states. This usually comes about in the following manner: The act creating a food commissioner's office in a state usually contains a proviso that the food commissioner of the state shall have power to make uniform rules and regulations to enforce the provisions of the food law. The food commissioner immediately proceeds to interpret this power to mean that he has the power to make new laws without consulting the legislature, or anybody else. Then he says in effect: "I rule that the standards promulgated by the Secretary of Agriculture as the official standards for the United States are the food standards for this state." And *ipso facto* these standards are the law in that state, in his opinion. Then the manufacturer must either reckon with the standards thus established, without any warrant of law, and having in fact absolutely no legal effect any more than a circus poster on a bill board, or get into trouble and be in continual trouble until he comes around to looking at matters in the way the food commissioner does.

I do not wish to be understood as throwing mud at all food officials. I am simply here stating the facts, and any food commissioner whom this cap will fit is welcome to wear it. A great many other so-called food laws are created in this way.

Fortunately, however, some of the food officials know their rights, and know a citizen's rights, and some of them enforce their laws along broad and reasonable lines. This is especially true of Illinois. I do not believe any food manufacturer can complain of unreasonable treatment in this state, and yet I know it to be a fact that the food sold in Illinois to-day is as properly labeled and as wholesome as in any state in the Union.

There is another phase of food laws that I cannot pass and do justice to this subject, and that is their changeableness and the great injustice that is done to food manufacturers on account of the same. One of the great principles of our government, and one on which we pride ourselves a great deal, is that no man's property shall be taken and confiscated without due process of law or without compensation. But this great principle does not hold good, or at least it holds by the barest thread, when applied to the food industry of America. A food manufacturer, under laws existing, may invest a million dollars in manufacturing food, and manufacture food legal in every respect under the laws of the state in which he does business and under the laws of most of the other states. The state legislature will then pass a law that will render every pound of that food illegal. The manufacturer finds that to-day he is doing a

legal business valued at a million dollars; to-morrow he wakes up and finds that his million dollars is invested in an illegal business, and he cannot sell a pound of his food. Since the 1st of January, last year, until the 1st of June of this year, about 42 state legislatures were in session, and over 500 food laws were introduced in those 42 legislatures. A great many of those food laws proposed to make some of the food, then legal in those states, illegal, and I dare say that not more than three or four of those laws made any provision at all for the disposition of such foods then on the market and legal at that time under existing laws regulating the manufacture and sale of those foods. It is easy to see where such summary action would be justifiable in dealing with foods actually poisonous or detrimental to the public health, but I dare say that there was no emergency existing for the immediate passage and enforcement of a single one of those 500 laws, and there was no just reason why all of such food in existence at the time, and legal under existing laws, should not have been permitted to be legally sold and disposed of, instead of being practically confiscated by legislation making it illegal.

Every year this sort of thing happens, and manufacturers are forced to lose hundreds of thousands of dollars simply because some official decides that the food law of to-day is not good enough to be the food law of to-morrow. Sometimes a mere technical change in a food law in a state will serve to render a great deal of the food then in the state illegal and it must be changed or relabeled before being sold. All this loss tends to and does increase the price of food.

Right here I might say that the public has a very wrong impression of adulterated and misbranded food. The public has been led to believe that adulterated food is unwholesome food, or at least not fit to eat, while, as a matter of fact, this is seldom if ever true. The great bulk of food cases and prosecutions are occasioned on account of labeling, more than anything else. Practically all of the food that is condemned as illegal could be made legal by labeling, except in those states expressly prohibiting the use of certain ingredients.

There has been a great deal said on the food subject on behalf of the public, but if the public knew the actual facts it would concede a whole lot to the manufacturer. And it must be remembered that the great bulk of these food laws do not emanate from the public. They are usually drafted in some food official's office and embody his ideas and not the public's; and are sometimes, even frequently, lobbied through a legislature by the officials who will hold jobs under them and enforce them, but who will not admit that they are lobbyists even under laws requiring any lobbyist to register as such.

There seems no just reason why an article of food that is legally labeled and legal in every respect under the National Food Law, and approved by the government of the United States, should not be legal in any state of the Union, and be permitted to circulate as freely throughout this land as the coin of the realm on which the government has put its stamp.

The ideal kind of a National Food Law is that kind only which would have the effect of making food shipped under it, and legal under it, legal anywhere. But the present law does not do this. It cannot affect the actions of the states, except to a limited extent. And it is hardly possible that any National Food Law could control the actions of the states in passing food laws.

Neither does it seem reasonable that an article of food that is not injurious to health in the state of Illinois should be injurious to health in the state of Wisconsin, just across the line. As a matter of fact, if a product is not injurious to health in the state of Illinois it is not injurious to health anywhere, and if it is injurious to health in Illinois it is injurious to health anywhere. If there is any doubt about the wholesomeness of any article of food, and the United States government says it is wholesome and the majority of the states say that it is wholesome, certainly the presumption should be in favor of its wholesomeness until better light is had on the question. The argument being made about resolving the doubt as to the wholesomeness of certain things in favor of the public is hardly a good argument in the absence of any evidence of positive harm. The world is full of doubters, on all subjects, even on all matters that affect the public good, and it hardly seems fair to ask the world to stand still until we investigate everything about which there is a doubt, but which shows no particular evidence of guilt or harm.

FLOUR BLEACHING; ITS RELATION TO BREAD PRODUCTION AND NUTRITION.*

GEORGE L. TELLER, M.S.
CHICAGO.

The paper which I am reading is an abstract of an article prepared by Dr. Wesener and myself, and published in the *Journal of Industrial and Engineering Chemistry*, vol. i, No. 10, October, 1909.

From an early date in the production of wheat flour the bleaching of the color has been practiced by millers before putting their product upon the market. Up to within the last decade the method employed was to store the flour for a period of several months, whereby the more or less marked yellow color of the flour was removed. This change in color was brought about not only by the direct action of the oxygen of the air, but also by the action of nitrogen oxids which are known to be produced in the air by electricity, as during thunder storms.

Not many years ago, a Frenchman discovered that the gas produced by discharges of electricity were capable of whitening the flour. He did not explain properly the cause of this whitening, but attributed it to the production of ozone (which it is now known does not readily bleach flour). It remained for two Englishmen by the name of Andrews to

* Read in a Symposium on Pure Foods before the Chicago Medical Society, Nov. 10, 1909.

discover that the bleaching was brought about by the action of certain oxids of nitrogen which are produced when nitric acid is brought in contact with a reducing agent, such as ferrous sulphate. Numerous processes have been brought forth for applying this principle to practical bleaching of flour in the mill. The process which has up to the present time gained the greatest ascendency in this country is what is known as the Alsop process, where air is pumped through a chamber in which a flaming electric arc is discharging. It can readily be shown that the air discharged from the pump contains small quantities of oxids of nitrogen which are in less quantities a natural constituent of the air and are essentially similar to the oxids of nitrogen produced by the natural discharge of electricity during thunder storms, and also result from the action of nitric acid upon reducing agents. Of more recent times the use of nitrosyl chlorid has been introduced into the art of flour bleaching, and possesses advantages over the oxids of nitrogen in the character of the bleach which it produces as well as in the simplicity of application to the flour. This gas can readily be liquefied and bought in small bulk for conveniences of transportation and storage. The pressure is ideal for the purpose, being at normal temperature from 15 to 20 pounds to the square inch. This pressure is an important point, and it materially aids in the methods of applying same to the flour.

The chemistry involved in the bleaching of flour has received much attention by us. We have isolated the coloring matter and have identified it, or at least have established a very close relationship for it with other natural vegetable colors. It is not the province of this article to go into this phase of the question. The chemistry of this reaction will be taken up by us in a later article. The color of the flour which is removed by the bleaching process is distributed throughout the entire flour-producing portion of the wheat berry, but is more abundant in the portion nearest to the bran, which is also the most nutritious. It is the purpose of the bleaching process to remove the yellow color instantly, instead of by the old process of storing for weeks and months. It should be clearly borne in mind in this connection that the yellow color which is removed by the bleaching process is entirely independent of any dark or inferior color produced by the presence of the bran which is ground up with the lower grades of flour. The coloring matter of flour is the one material in the flour which shows the greatest avidity for uniting with the gases which are used in bleaching. The action on the coloring matter is instantaneous, and the amount required for the purpose of bleaching the flour is very minute. If an excess of the gas is used, it will eventually combine with other substances, primarily the gluten and finally the oil. It is only when the flour is overbleached and ruined that the action on these constituents of the flour is sufficient for it to be detected either by chemical or by physical properties. It was conceded in the flour-bleaching case conducted in North Dakota, as well as at the hearing in Washington, D. C., that the average amount of nitrite reacting nitrogen in commercially bleached flours is practically one part per million. In our own experiments we have often found much less than

this amount. It has been still further conceded on the part of even those opposed to the bleaching of flour that only a small proportion, and in some instances not any, of the nitrite reacting nitrogen is present in the bread. We have in our own experiments conclusively shown the cause for this disappearance of nitrite reacting nitrogen, and have found it to be due in a large measure to the action of the yeast which is used in the production of the bread, the nitrite being consumed by the yeast and bacteria. In accordance with the facts well recognized by bacteriologists, nitrites form an excellent food for bacteria.

The nitrite reacting material of flours is also removed by the action of heat. Quantities of bleached spring wheat patent flour were dried over night, and in the morning examination for nitrites was made in the usual way. Where the flour was dried at a temperature of 221 F., all of the nitrite reacting nitrogen disappeared. At a temperature of 169 F. it was reduced from 0.37 to 0.22 parts per million. At a temperature of 104 F. no change took place. When the flour was made into a soft dough with water and allowed to ferment over night at a temperature of about 100 F., all of the nitrite reacting nitrogen disappeared. The same was true when 1 gram and 2 grams of yeast were added to the flour in making the sponge. When, however, chloroform was added to stop the action of yeast and bacteria, the nitrites remained as in the original flour. In other experiments it was found that no change took place in a sponge made directly from flour without the addition of yeast when kept over night at ordinary room temperature. Better action took place, however, when 1 and 2 grams of yeast were added to the sponge. There was then a reduction from 0.37 to 0.018 parts per million. In these latter experiments the nitrite reacting nitrogen would have all disappeared had the correct incubating temperature been used, except when chloroform was added. From the results of these experiments we see that drying at sufficiently high temperature dispels all of the nitrite reacting nitrogen; that the bacteria in the flour when given sufficient water in the making of a dough and kept at suitable temperature have the property of utilizing this nitrite reacting nitrogen for their own growth, either changing such product to nitrates or ammonia or even building such nitrogen compounds into more complex organic nitrogen compounds for its own economy.

That the presence of even considerable amounts of nitrite reacting nitrogen in flour acts favorably to the development of yeast dough and not as a preservative is apparent from experiments made by adding nitrite of soda in varying quantities to a sponge dough made with yeast and allowing the same to ferment at a proper temperature for its development. No effect injurious to the expansion of the dough was apparent when a quantity of nitrite reacting nitrogen is added to the flour in quantities two hundred times as great as is present in commercially bleached flour. On the other hand, this larger amount was found to be beneficial to such expansion. It was also found that when bleaching gases were added to the flour sufficient to produce nitrite reacting nitrogen to the extent of 60 parts per million, the flour was entirely destroyed

for commercial purposes, because of the well-known xanthoproteic reaction whereby the flour was highly discolored, producing a reddish yellow shade, and because the character of the gluten was changed by the action of this large amount of acid-producing gases upon the gluten. Even in this aggravated condition the growth of the yeast was not prevented, and the bread-making property of the flour was not destroyed, although the bread was of inferior quality. Attention should be called to the fact that, in the experiment noted above, sodium nitrite was used, while in the gas-treated flour the sodium was not added, the acid in this case being in part at least united with the gluten, forming with it the well-known class of syntonin bodies. It is known that bodies of this character are continually formed during the process of breadmaking by yeast, and are an essential step in such process of breadmaking.

We have been making daily examinations of flour received from all parts of the United States and from foreign countries, including Canada, England and South America. This has naturally brought us in contact with flours of all kinds, from all classes of wheat, and representing all methods of milling. This work has been done for the purpose of ascertaining the breadmaking and commercial values of these flours. During the last five years probably 90 per cent. of the flours which we have received have been bleached, and we have not in a single instance found any flour which appeared to be in any way injured by the process of bleaching. The analyses which we make of these flours is very thorough, as the commercial value which depends on the quality of the bread is based on our reports. In addition to this general analytical work on flours, we have made a very thorough and exhaustive study of the same flours, bleached and unbleached, to determine any defects which might have been produced by the action of the bleaching gases upon the breadmaking qualities of the flour. We have found that in every instance the only essential change in the character of the flour was in a whitening of the color, and in some instances an increase of the water-absorbing capacity of the flour.

Where there has been any slight difference in the volume of the bread which could not be attributed to natural variation in the work, it has been if anything slightly in favor of the bleached flour. The same is true of the number of loaves of bread which are produced from a barrel of flour. The amount of yeast necessary for the production of bread from bleached flour, which we call the fermenting period, was in no way increased over that required for the unbleached flour. The quality of the gluten as shown by its capacity for expanding into a good-sized loaf of bread has not been found to be in any manner injured. The average value, which in our report is based upon the color of the flour, the character of the bread, the amount of bread and the size of the loaf, was a little higher for the bleached flour than for the unbleached, because the color of the flour and the color and quality of the bread were improved. The flavor of bread is subject to much variation, due to the methods of bread-making, and is also one of the most difficult points to determine in the comparison of breads under examination. We have made careful com-

parisons along this line and have been unable to detect any deterioration of flavor when both flours, bleached and unbleached, were submitted to the same process of breadmaking.

The patent flour as compared with the clear is relatively deficient in protein, fat and mineral matter, and for this reason possesses less nutritive value than the clear flour. When these two flours are combined they constitute the straight-grade flour, which is intermediate in character between the patent and the clear, and possess most of the advantages of the former without the disadvantages of the latter. Though less costly to produce than a patent flour, the straight grade possesses, except as to color, all the essential qualities of the patent as an article of food. While an experienced eye can readily distinguish between the grades of flour used when a straight-grade flour from which the color has been removed is baked into bread and compared with bread from a patent flour from which the color has not been removed, it is our experience that preference will be given to bread made from the straight-grade flour.

For the purpose of obtaining some data as to any injurious effect which might be produced in animals fed on bread made from bleached flour because of the presence of deleterious substances which certain opponents of bleached flour claimed were produced in it by the action of the bleaching gases, bread made from the same flour, bleached and unbleached, was fed to two lots of a dozen white rats each. The one lot of rats received only water and bread or biscuit made from the unbleached flour, the other water and bread or biscuit from the bleached flour. The rats were kept under close observation, and at the end of two months the greater number of each lot were killed and a careful examination made of the various organs of each. This latter work was done by the medical department of the Columbus Laboratories under the direction of Dr. A. Gehrmann. Careful and full record was kept of the various organs of each rat killed, including a microscopic examination of many. In no instance was there any indication, either before or after death, of any injurious effect whatever being produced by the bleached flour.

Exactly similar experiments were carried on by Dr. Walter S. Haines, professor in the Chicago University, with entirely similar results. Similar experiments by ourselves with flour bleached with nitrosyl chlorid showed like results. In addition to this numerous guinea-pigs have been fed at the laboratories during the past seven years, bread from bleached flour as the greater part of their diet, and in no instance has there been any indication of any injurious effect being produced in them by such bread. Many of them have been put to death for other purposes and the organs carefully examined. In no instance has there been any indications of any abnormal condition present which could be attributed to any constituent of the bread which they had received.

Statements relating to the poisonous effect of bleached flour and extracts made therefrom were made by Prof. E. F. Ladd and given as testimony in the North Dakota flour-bleaching case; again at the hearing held before the Secretary of Agriculture at Washington, D. C., finally published by Professor Ladd in "Government Agricultural Experiment

Station, Agricultural College, North Dakota, Special Bulletin No. 9, issued December, 1908," and later given as testimony by him in an important bleached-flour suit in England, by all of which means they have been given a wide publicity. Ladd states that he administered to rabbits alcoholic extracts of bleached and unbleached flours made and evaporated under certain specified conditions. The extracts from the bleached flour were reported by him to have produced death in a short time, the post-mortem findings being those of a corrosive poison. The experiments as detailed by Ladd have been carefully repeated by Professor Haines and Professor Snyder during the trial in North Dakota, by ourselves in connection with Professor Haines at the Columbus Laboratories, by one of the most noted American physiological chemists, and by competent English investigators, and in all these cases the results were found to be diametrically opposite to those reported by Professor Ladd.

In our own experiments we made alcoholic extracts from a flour which we had bleached by passing four times through gases from an Alsop process machine, and which contained 2.8 parts nitrite reacting nitrogen per million, also a similar flour very excessively bleached by nitrosyl chlorid, containing 30 parts nitrite reacting nitrogen per million. The extracts were rapidly evaporated at low temperature by use of a vacuum pump and the residue from about 250 grams of flour administered to rabbits in the same manner as Ladd had done. No effect whatever was apparent, either in the rabbit to which the extract from the Alsop process bleached flour was given, nor in that to which the extract from the flour bleached with nitrosyl chlorid was given. The acidity of the alcohol extract was identical for the three samples of Sunnyside flour, the unbleached, that bleached by the Alsop process, and that strongly over-bleached by nitrosyl chlorid.

Because of the findings of others who have thoroughly investigated this question, the contention of Professor Ladd of the presence of deleterious substance in commercially bleached flour has been thoroughly discounted by the court in North Dakota and the high court in England in which his testimony was introduced, and by all scientists who have investigated this question for themselves. Both judges in the courts specifically declared that the evidence was strongly against the presumption of the presence of any such deleterious substance in the flour thus artificially bleached. Furthermore, the court in England and the high court in France have made it a part of their decisions that such bleaching of flour is a meritorious process advantageous to the art of milling and the production of food for man.

The absurdity of Professor Ladd's statements is apparent without experiment, when we calculate that the total amount of nitrous and nitric acid which might be present in one of the flours which he used for his test, based upon double the amount of nitrite reacting nitrogen found (3 parts per million), and all calculated to nitric acid, is equivalent to only 5.4 milligrams (1/10 drop) of nitric acid; that the amount of nitric acid is practically 1/100, the medicinal dose of nitric acid as given in the U. S. Dispensatory, and that according to Professor Ladd's

testimony, the liquid administered to the rabbits was much greater in amount than necessary to produce the dilution specified in that work for internal doses of nitric acid. Under the circumstances we could not expect any corrosive action from this amount of acid, even assuming that it could have been separated out of the flour as free acid without in any manner combining with the organic matter of the flour and alcohol.

The assertion made by Ladd and others that the acidity of commercially bleached flour is increased and the iodin absorption of the oil of such flour is diminished was fully refuted by tables introduced into the North Dakota flour-bleaching case showing the results of a considerable amount of analytical work done by the United States Department of Agriculture, in which these points received careful attention. No such increase of acidity or decrease of iodin absorption was apparent. These results here given fully corroborated by our own experiments along these lines.

The claim by Ladd of the detection of a diazo composed of the nature of tyrotoxicon in commercially bleached flour was shown to be in error by ourselves in connection with Professor Haines by experiments in which exactly similar results as those described by Ladd were obtained when unbleached instead of bleached flour was used. The finding of such a substance by the method which he used would be very doubtful even if it were present. Its presence in cheese and milk is caused by bacterial growth and not by a process in any way similar to the bleaching of flour.

Nitrites and nitrite reacting substances, which form the chief basis of the clamor of the opponents of bleached flour against that material, are very widely distributed throughout the mineral, vegetable and animal kingdoms. We have entered more into detail in the question of this distribution in a former paper (published in *American Food Journal*, Chicago, Sept. 15, 1907), and will summarize the facts only very briefly here. Nitrites are found in many drinking waters. They are objected to in that connection because their presence is an indication of the bacteriologic condition of the water, and not because of poisonous qualities of the nitrites themselves. Nitrites are found in considerable quantities in soils and in such common foodstuffs as salt, baking soda and baking powder. They have been found in small quantities in green vegetables, including celery and other articles of food. They have been found in considerable quantities in preserved meats, especially those in the preparation of which saltpetre is used, and the formation of nitrites is apparently an essential step in the preservation of meats by saltpetre. We have found ham bought in the open market as high as five parts per million of nitrite reacting nitrogen, or five times the average maximum amount found in commercially bleached flour. Nitrite reacting nitrogen is found in all parts of the animal body, and is nearly always present in comparatively large quantities in the human saliva, including the normal saliva of healthy nursing infants. We have found in the saliva of man as high as 13 parts per million of nitrite reacting nitrogen, which is 13 times that found in bleached flour. While nitrite reacting nitrogen can nearly always be found in flour which has been bleached with nitrogen peroxid,

the presence of nitrites in flour is not a proof that they have been bleached, for, as shown by Dr. Weil (*Chemiker Zeitung,* Jan. 9, 1909), he has obtained reaction for this substance by the Greiss Ilsovay test in samples of unbleached flour and in wheat which he has examined.

After having devoted much time and energy during the past several years to a careful study of the question of flour bleaching in all its relations, we would sum up our findings briefly as follows: The essential action of the bleaching of flour is to remove from it a small amount of yellow color, which in itself is in no wise a valuable constituent because it detracts from the flour in the eyes of the consumer by whom the demand for flour is created. As shown in the rulings of high courts which have passed upon the matter in England and in France, the bleaching of flour is an improved step in the process of milling whereby a superior product is prepared for the consumer. The best results are obtained by its use only when thorough purification and cleaning are adopted, and it in no way contributes to the covering up of an unsound or damaged condition in the wheat. Any imperfection in purification or cleaning are made more apparent by the bleaching because these defects are in a manner covered by the coloring matter when it is present. Any improvement in quality brought about by removing an unusually large amount of color present in a flour which was inferior because of the presence of such excess of color, certainly cannot be looked upon as in any way injuring or deceiving the consumer, as has been contended by some, for the cause which produced the inferiority now no longer exists. The prohibition of the bleaching of flour would curtail the use and cut down the price of durum wheat, and all wheats which have an intense yellow in spite of the fact that aside from this some of these wheats produce flour of the very highest quality. The effect of this is naturally felt more by the producer of wheat and the consumer of flour than by the miller whose prices are regulated by market values and competition. The most searching investigations have failed to show the presence in the commercially bleached flour of any substance that in the minute quantities in which it is present is in any way injurious to the breadmaking qualities of the flour, or is in any way poisonous or has any toxicologic or preservative action, or any action which is prejudicial to digestion or nutrition.

103 State Street.

MALARIAL FEVER.*

GEORGE C. KASDORF, M.D.
ROBINSON, ILL.

Chills and fever, fever and ague, bilious and gastric fever, swamp fever, according to prevalent symptoms, are synonyms for malarial fever. Definition: An infectious, non-contagious disease caused by the hematozoon of Laveran. It is characterized by its prevalence in certain districts,

* Read before the Crawford County Medical Society, Robinson, Sept. 9, 1909.

its periodicity, usually a chill, fever and sweat, splenic enlargement and anemia in certain protracted cases. Varieties: Intermittent, in which the temperature comes to normal between the attacks; remittent, where it does not reach normal; pernicious malaria; malarial cachexia; masked intermittent, and malarial hematuria.

Historical Note: There are few diseases with which the profession has been acquainted longer than with malaria, and the earliest known hot-beds were the city of Rome, the Pontine marshes about the latter and the swamps of the lower Danube. The prevalence of the disease has long been and is still diminishing, in consequence of drying up of marshes, which thereby become unsuitable for the development of the mosquito. In Europe malaria is unknown to large areas. New England, once a malarial section, has far fewer cases, and the Middle West, through cutting down of woods, has not as many malarial occurrences, although the loam soil is favorable for it. In 1848 Noth, of America, maintained that both yellow fever and malaria were transported by the mosquito. King, in 1883, showed that malaria was transmitted in this manner. In 1891 Laveran recognized the mosquito as an intermediary host of this parasite. Similar views were held by Pfeiffer and Koch in 1892 and Bigami in 1894.

Pathology: The direct effect is attributable to the action of the malarial parasite upon the blood. The chief and constant morbid lesions are destruction of red corpuscles and symptomatic anemia following the same. There is a marked tendency to accumulate pigment in certain organs, particularly spleen and liver, the hemoglobin being converted into melanin. The malarial parasite also engenders a toxin, which, in part, may be responsible for the disease. The first change is the development of little portions of coloring matter, taken by the parasite from the blood-cell, segmentation then takes place upon the surface and when the spores mature the blood-cell is burst, the germ spreading into the current. Just before the latter occurs the paroxysm commences. The pigment of the blood-cells liberated is picked up by the leucocytes and deposited in the liver, spleen, kidney and skin. The fever is believed to be Nature's effort to rid the system of the germs and toxin; the blood destruction causes anemia, which latter becomes cachexia. The spleen is engorged with blood, at first swollen, but soon it becomes permanently enlarged (ague cake). A rare accident in malaria is rupture of the spleen. The liver is engorged, but not to the same extent; the heart chambers may be found acutely dilated; neuritis has been observed.

Etiology: The knowledge of the parasite depends upon the cycle discovered and may be classed under five heads: 1. Discovery of the plasmodium malariæ in the blood of persons suffering from the disease. 2. Its developmental cycle in man (sporulation), as shown by Golgi in 1885. 3. The discovery by McCallum of its method of sexual fertilization. 4. Its fertilization and development in an intermediary host (the mosquito), pointed out by Surgeon Major Ross, England. 5. The observation of the Italian School, showing its method of re-entering the tissues of man.

Predisposing Causes: 1. Soil; fresh-water marshes favor the development of malaria, and are most fruitful when located near the coast and

tainted with salt water. Marshy districts affording luxuriant vegetation are notorious as malarial foci. These facts account for the chief sources of the infection being situated in the tropics, low lying districts and deltas of rivers. 2. Climate: Malaria occurs most frequently in the tropical zones, less frequently in temperate regions, and more so in the latter than in the polar latitudes. 3. Rapidly growing trees dry the soils by absorbing the moisture. The eucalyptus tree was extensively employed in the Roman Campagna to protect these swamps and make them almost entirely free. 4. Season: In temperate latitudes most cases are developed in autumn, with its height in September. 5. Elevation: Persons living in higher regions are less affected, also those in upper stories of dwellings. 6. Race exerts little influence, although in the United States the negroes are slightly less susceptible than are the whites. 7. Sex has no influence, except that males may be more exposed in their occupation.

Intermittent fever is characterized by a sudden rise of temperature, with slight prodromata, such as headache, pain in the nape of the neck, a yellowish complexion and a slight splenic enlargement, or no premonitions and by its sudden drop to normal and regular periodicity of occurrences. Its forms are: quotidian, occurring every twenty-four hours; tertian, occurring every forty-eight hours; quartan, occurring every seventy-two hours. Pathologic changes are few in mild cases. The prolonged cases have marked internal lesions. With every chill there occurs an acute congestion of the internal organs, particularly liver and spleen, due to hyperemia, and in cases of longer duration interstitial changes are produced, without being, however, a true cirrhosis.

Etiology: The hemameba causing tertian intermittent fever begins its asexual cycle of evolution in the red blood corpuscles as a small hyaline ameba. Its development is attended with the appearance in its interior of fine, brown, motile granules in the form of pigment, and when matured it is about equal in size to a normal red corpuscle. It assumes a spheric form, the pigment collecting centrally, and sporulation into from fifteen to twenty segments follows. The tertian parasites are exceedingly numerous in the blood, and pass through the various stages of their life cycle almost simultaneously, the sporulation of an entire generation occurring within the space of a few hours (Golgi). The paroxysms follow the process of sporulation, which is attended most probably with the formation of a toxin, and the symptoms of the disease may be attributable chiefly to the effect of the latter. The red corpuscles that include the parasite become enlarged and decolorized as the latter develops. The parasite of tertian intermittent runs its cycle in about forty-eight hours, with a paroxysm every second day; if occurring on successive days, a double infection may have occurred, with two distinctive crops, quotidian intermittent.

The hemameba causing quartan fever cannot be distinguished from the tertian parasite at the beginning of the asexual carrier. Its ameboid movements are more deliberate, and its pigment granules are coarser, darker, and also less motile than those of the tertian organisms. Unlike the latter, they do not attain the size of the red corpuscles, and during sporulation the segments (5 to 10 in number) encircle in an orderly way

the central pigment mass or clump, "rosettes" of great beauty thus being formed. The red corpuscle that harbors this parasite contracts, appears shrivelled, and its color changes at the same time from the normal to a deep greenish or bronzed tint. It sporulates about 72 hours after it enters the red corpuscle; hence paroxysms occur every fourth day, quartan intermittent; a double infection every second day (48 hours). Triple infection causes daily paroxysms.

Symptoms: The prodromata are nausea, languor and headache from recession of the blood internally. The chill starts with a slight shiver up the back, running into a profound rigor, involuntary movements being attended with trembling. The surface is roughened, the blood going to internal organs, the temperature of the surface being sometimes subnormal, while in the rectum it is 105. The voice is weak, respiration rapid and inclined to be sighing. The chill lasts from one-half hour to an hour. The tongue is coated and breath foul from gastric irritation. The patient often vomits stomach contents and bile. The cold stage fades gradually into the hot, pulse becoming frequent, skin heated, patient restless, complaining of headache, and temperature rises to 104 or 105. Thirst is intense, with dry tongue and possible nausea and vomiting. This stage lasts from one to four hours. During the chill the urine is pale and abundant, while in the hot stage it is scanty and high colored. After a time the hot stage passes into the sweating stage, and the ease and comfort produced generally causes the patient to sleep. The temperature returns to normal at least by next morning, and he feels pretty well until the next paroxysms, though if oft repeated he feels always weakened, slight jaundice appears and the organs become enlarged. If the paroxysms are stopped the disease is tending to a cure; the shorter the disease the more are cachexia and other complications avoided. The fall in temperature may be unbroken by any fresh elevation, though more often the latter occurs. Less frequently the deffervescence occurs by steps; the temperature may fall one or more degrees, remaining at the new level for a short period, then dropping again an equal distance until it becomes normal. The sweating stage may be internal in form of a diarrhea. In children the paroxysms may run into convulsions and in a nervous child take on a remittent type, as the child is so impressed that it does not recover between the attacks. Epilepsy may be held in check by malaria. Pneumonia is the most formidable malarial complication, those going North after residence in a hot malarial district being liable to contract a double pneumonia of an adynamic character. A favorable prognosis should never be given in pneumonia associated with malaria.

Diagnosis is usually easy from the symptoms and history of residence, or the effect of quinin. From remittent fever it is diagnosed by the course of temperature. In pyemia the chills are irregular, a pale and not a yellow countenance, pulse is reduced and temperature does not come to normal except from shock. In the intermittent type the fever and chills occur in the morning, in tuberculosis the chills in the afternoon, fever in the evening and toward morning, and there are physical signs and the history.

Remittent or Continued Malarial Fever:. Estivoautumnal Fever.—On account of the intensity of the gastrointestinal symptoms this variety is also termed bilious remittent fever. It prevails in warm and truly tropical climates, though it occurs in milder forms in temperate zones.

Pathology: Melanosis of the spleen, liver and brain is generally observed; on the other hand, in rare instances the internal organs were found to be non-pigmented on autopsy. The spleen, if it be a fresh infection, becomes swollen, but it is soft; in protracted cases, permanently enlarged and firm. Microscopically the pigment is seen to be most abundant in the spleen-pulp and within and around the splenic veins. The liver is enlarged in like manner. The pigment that is found in the form of granular masses in all the hepatic tissue elements gives the organ a bronzed appearance (bronze liver). As in pernicious malaria, so in this affection, the brain, and particularly the gray matter, is in long-standing cases of a dark brown or almost black color. The arterioles are often found stuffed with phagocytes and blood discs, which contain pigmented parasites. Punctate hemorrhages may occur in the brain. The kidneys are pigmented and may show a severe acute degeneration of the cortical tubule cells (Ewing). Other organs, as skin and lymphatic glands, become more or less deeply pigmented. The blood shows marked hydremia, with partly or wholly degenerated red blood discs in abundance.

Etiology: The endogenous cycle of this variety is evolved chiefly in certain of the internal viscera, and microscopic examination of the blood in the various stages of the disease does not always give a positive result. The organism invades the red blood corpuscles, but to what extent is questionable. It is a small hyaline body, its size at maturity scarcely equaling one-half the dimension of the red cells, and it accumulates a very few fine pigment granules. The parasite may be found in the later stages in the blood from certain internal viscera, as the spleen. After the condition has lasted for some time the characteristic oval and crescentic bodies, more or less refractive, may be observed in the fresh blood. The so-called sickle-form bodies show central rods and clumps of coarse pigment, and are especially connected with the malignant type of fevers. Ring-form bodies, and at times the signet ring forms, are observed. The red corpuscles at whose expense the parasite develops assume a brassy green hue, becoming shrivelled and often crenated.

Symptoms: There may be prodromal symptoms lasting a day or two, but the signs are variable. The onset proper is more or less sudden and abrupt, but less so than in intermittent fever. Shortly after the chill the temperature rises to 104 or 105. The cold is not so marked, but the hot stage lasts longer, with aching in the brows, back and legs. The fever gradually goes down, but the slight sweat is not of a refreshing character. As the hot stage develops, the system is profoundly affected, the hyperpyrexia may be such as to be very dangerous, especially after exposure to the sun or the influence of alcohol. The skin is dry, face flushed, headache severe, muscular pains marked. The respirations are quickened by the fever and congestion of lung. The pulse is full and hard; there is a fulness and tension in the epigastrium. Violent vomiting which does not give relief, the amount ejected exceeding amount ingested,

may become bloody and resemble black vomit of yellow fever (gastric remittent fever). The symptoms last ten to twelve hours, then gradually abate to become the period of intermission, the time usually employed for treating. In severe cases the remission can only be detected by the thermometer, it lasting two hours; in mild cases from ten to twelve. The longer and more marked the remission, the better the prognosis. The remission ends in a chilliness, quickly followed by the hot stage as before, or a little worse. The fever may become continuous, without any marked remissions. A paroxysm should begin about noon and continue to about midnight, then remission persists until about noon the next day. If the fever is unchecked, the remission becomes shorter, and in about a week there will be a continuous typhoidal state, with dull heavy countenance and sordes. The vomiting is not so constant after the first week, and there is constipation in contradistinction to typhoid. If not watched a diarrhea may be set up from irritation along the gastrointestinal tract, and if offensive is of an evil omen; so also is hiccough when continuous and appearing late. There is much hepatic disturbance, but rarely marked jaundice. If the case cannot be controlled, the pulse becomes weak, thready, feeble; the patient slips down in bed and subsultus tendinum sets in. He may have low muttering delirium, tympanites, all the symptoms of typhoid except the rash, and a blood examination will be necessary. If the case is recovering the remissions become more marked. Urine is scanty and high colored all along and may contain albumin. Delirium is rare except in those who have lived imprudently.

The bilious remittent type is accompanied by more or less catarrh of the common bile duct, vomiting of the bilious material, and yellow skin; there is tenderness of the liver. In children it runs the same course, except that it is more likely to be followed by cachexia.

Diagnosis—Remittent and Typhoid.—In remittent fever the parasite can be found; rapid increase of temperature in first few hours to 104 and 106; marked remissions; no spots; constipation at first perhaps, followed by diarrhea. In typhoid there is slow development, and rise of temperature not reaching maximum before the end of the first week; no marked remissions; spots in 99 out of 100 cases and diarrhea at the outset. In the second week the appearance of both is alike.

Remittent and Yellow Fever.—In remittent fever there is rarely black vomit or scanty albumin; quinin has a characteristic action. In yellow fever the temperature is continuous after establishment; considerable albumin as a rule and black vomit.

Prognosis in simple remittent fever is good, 95 per cent. tending to recover. Death never occurs except after the seventh day, unless from complication; in yellow fever it is common on the third. Yellow fever is contagious, requires a mean temperature of 72 degrees, and has its own habitat. Remittent fever is not contagious; is mild in the East, but often fatal in the South and the West. Meningitis, pneumonia, gastroenteritis, dysenteric diarrhea and the condition of the patient at the time of the attack may make the case dangerous. Faint uncertain remissions and a tendency to collapse at the end of exacerbation are bad signs, as is also a tendency to hemorrhage. The duration is from ten to twenty days.

Pernicious Malaria.—This is an extremely dangerous form and fatal if allowed to continue, though 75 per cent. may be saved. It may follow intermittent fever, but is usually remittent and of the quartan variety. It depends upon the estivoautumnal parasite almost invariably. The condition is brought about probably by a great number of germs and by their rapid reproduction, the vessels being found crowded in the parts in which the characteristic symptoms occur. The danger arises from involvement of particular vital organs. Another factor is probably the production of a specific toxin. The lesions are more those of intermittent than of remittent. The first symptom is usually a prolonged chill, which has often occurred before the pernicious character set in.

Varieties.—Colliquative, is characterized by a profuseness of sweating. Comatose, the most common, by intense headache, perhaps vertigo, stammering or inability to speak, ushering in the hot stage, when stupor occurs. The pupils are now dilated, face flushed, temperature 105 to 106. The patient lies paralyzed in bed, and urine is retained and albuminous; the bowels move involuntarily; the breathing becomes stertorous. This lasts for several hours, and if he comes out at all does so in twelve hours; then sweating and gradual returning to consciousness, taking five or six hours. The next attack often proves fatal. Delirious, exhibits an active violent delirium in the hot stage; the face is flushed, eyes brilliant, pupils dilated. The pulse is full and hard; temperature 107 to 108; patient cries and screams. With the end of the hot stage fatal coma often comes on in first paroxysm. This kind is not the most common, but dangerous. Gastroenteric much resembles true cholera. In the hot stage the patient is seized with uncontrollable purging and vomiting, the material is soon blood-stained and stools resemble salt-brine or rice-water. Pulse is small and thready, thirst intense, countenance blue; cramps in legs; breathing becomes shallow, sighing and feeble. The patient is very restless, and may spring out of bed just before the fatal end, which occurs with collapse in six to eight hours. Algid, exhibits rectal temperature, 107 to 108, while by surface it is low. The patient feels cold externally. The surface temperature may be 85 to 90, and after the hot stage there is a marble feeling and cold sweat, the temperature becoming normal by rectum. The voice is feeble, heart imperceptible. Icteric, presents swarms of germs in the liver. The hematuric presents profuse bleeding from kidneys. Pneumonic or dyspneic, does not consist of a true pneumonia, but simply of an intense congestion of the lungs. In any of these forms the second or third paroxysm may prove fatal.

Diagnosis.—Inquire if prevailing epidemic is quartan. The comatose type may be taken to be apoplexy. In latter, however, pulse is slow, full and hard, and becomes irregular, hemiplegia occurs suddenly, pupils may vary or be contracted; there is a sudden loss of consciousness and patient as a rule is stricken in full health. Meningitis is distinguished from the comatose variety by several days elapsing before the coma is reached, with preceding pains in the head, photophobia and a mildly increasing delirium. The pulse is small, tense and wiry, and temperature ranges only from 102 to 103. Gastroenteric, pernicious malaria is likely to be confounded with cholera. In the latter the stools are always rice-water,

while in malaria they are at first blood stained. In malaria the parasite may be found and cholera has albuminuria constantly present. Icteric forms are to be diagnosed from yellow fever by history, generally by an exposure to malarial miasm, or by the prevalence of yellow fever.

Prognosis is always unfavorable unless controlled before the second paroxysm, as most live through the first. The mortality is greatest at the onset of an epidemic. Marked remissions or a total intermission is favorable. The gastroenteric and algid types are most fatal, the outlook being better in the comatose and the delirious. The extremes of life and intemperance are unfavorable.

Malarial Cachexia, chronic malarial infection, occurs either as a sequela, or is developed independently in one who has never suffered from either form, but has resided in a malarial district. The morbid anatomy is the same as in those conditions, and the spleen may enlarge from eight to twelve times its normal size.

Symptoms: Most prominent is the anemia from poor blood. There may be vertigo, tinnitus aurium, loss of memory, amaurosis, anorexia, constipation or diarrhea, nausea, flatulence, gastric catarrh, pains below the belt, epigastric oppression and often morning diarrhea, the slight periodical congestion resulting in an internal sweat. The sleep is usually unrefreshing, possibly a pain in back, legs or joints, muscular fatigue, short breath, palpitation and dyspnea. The nervous system suffers most, the anemia being a frequent cause of neuralgia. Localized anesthesia is common along outer thigh or arm, a numbness which makes patient consult from fear of paralysis. Itching of the skin may be marked and tickling and burning of the soles of the feet, which is also characteristic of gout, may be present. Genuine hemiplegia may result from the germs crowding the motor areas. If in peripheral neuritis most causes can be excluded, always consider malaria. Various mental derangements may arise and also nephritis, or the poison may attack stomach, bronchi or intestines. Hypochondriasis is common, also facial neuralgia, coming on before noon and lasting until night. There may be periodical hemorrhages from mucous membranes. In long-standing cases the spleen does not completely recover; in all other cases recovery may be expected. The diagnosis is aided by the enlargement of the organs, the microscope, periodicity and circumstance of development.

Masked Intermittent.—This presents itself in the same way as cachexia, but has no fever. This type comprises a long list of symptoms, at the head of which is neuralgia. Most often the supraorbital branch of the trigeminus is involved. A striking periodicity may be observed, the painful paroxysms usually beginning in the morning and terminating in the late afternoon. The patient's sufferings increase steadily in intensity until just before the close of the attack, when they suddenly abate.

Malarial Hematuria and Hemoglobinuria.—The hemorrhagic form of pernicious intermittent, in which hematuria is a prominent symptom. The reduction in red cells is as low as 670,000, while seven out of ten red cells may contain parasites. This form is observed at the onset of cold weather.

Symptoms: A mild cold stage, a sub-febrile temperature to which is added hematuria, often hemoglobinuria. The paroxysms may be daily, bi-daily, or at longer intervals, or may be continuous.

ACUTE GENERAL PERITONITIS.*

C. E. Beecher, M.D.

GILSON, ILL.

In selecting this subject I attempted to select one that the general practitioner meets with in the every-day walks of his profession, and have tried to simplify it and make it as concise as possible without omitting any of the salient points of the disease.

The surface of the peritoneum, we are told, is as large as that of the integument of the body; in its reduplications and folds it practically surrounds all the abdominal viscera and organs. It is, therefore, exposed to infection on all sides. The infection is always one of several micro-organisms which gain access to the peritoneal cavity. The pathogenic germs that most commonly give rise to peritonitis are the *Bacillus coli communis, Staphylococci aureus* and *albus, Bacillus pyocyaneus* and *Streptococcus pyogenes,* the gonococcus and the tubercle bacillus. The infection is not always a pure culture, but is usually mixed, several forms of the above pathogenic micro-organisms being present. The peritoneum may be invaded in four ways: 1. From the general circulation, the so-called hematogenous peritonitis. 2. By bacterial invasion from neighboring organs without perforation, or infection by continuity. 3. Following perforations of any of the viscera. 4. Infection from penetrating wounds or abdominal operations, not perforating the viscera. The first is a rare cause of acute peritonitis and is usually the result of an infection by the pneumococcus or tubercle bacillus. In either, the disease is of little importance, because the lesions are usually secondary to a severe infection in some other organ of the body, such as the lung, and therefore usually beyond treatment. The second type, however, is a very important one, including, as it does, the group of puerperal infections and a certain number of cases of appendicitis. The puerperal invasion is a direct growth of the species causing the disease along the extremely abundant lymphatics of the uterus and adnexa, and thence to the peritoneal cavity through the lymph spaces of the peritoneum. In the appendix the case is somewhat different. Here the organ may be surrounded by an abscess yielding on culture nothing but the colon bacillus, while in sections of the organ, properly stained, the whole thickness of the wall will show an abundance of streptococci. The colon bacilli of the abscess have been able to pass through the diseased tissues of the appendix and form an intraperitoneal abscess and have outgrown the less vigorous streptococci. Much the same form of invasion is seen in strangulated hernia. Here the fluid contents of the hernial sac are found to contain certain bacteria in a certain number of cases, even though the intestinal wall is not gangren-

* Read at Semi-Annual Meeting of the Knox County Medical Society, Sept. 16, 1909.

ous. In puerperal infections the streptococcus is the almost constant factor, while in appendicitis and strangulated hernia the streptococcus and colon bacillus are commonly found. Perforative peritonitis, on the other hand, is a true polyinfection. Often as many as ten different species have been found, although it is doubtful that they all contribute equally to the peritoneal inflammation, the active agent in this case being the streptococcus with a secondary infection of the colon bacillus.

The reasons for the recent change of opinion concerning the active part taken by the latter in the pathogenesis of peritonitis are numerous. In the first place the growth of colon bacillus is so rapid on all media in common use that other species, especially the rather feeble streptococci, are soon overgrown in plate cultures and their recognition rendered impossible, when by staining the tissues or in cover-glass smears from the peritoneal exudate the streptococci are found to be abundant. Another fact not absolutely convincing, yet of some importance, is the relative slight pathogenic property of the colon bacillus when injected into animals compared to that exerted by the streptococcus under similar conditions. Animal and human susceptibility to a given micro-organism are not at all times parallel, but, as a rule, virulence to animals can be accepted as some indication of its relation to man. The peritonitis produced by infection during an operation or by material carried into the abdomen by a stab wound or pistol-shot wound usually shows the streptococcus or staphylococcus as the active agent, the staphylococcus being found most often. The infection in these cases is often of a most virulent type, producing a rapid spreading peritonitis, soon becoming general.

To produce a bacterial peritonitis, several factors are necessary. The injection of a moderate quantity of a cloudy culture of bacteria into the peritoneal cavity produces no peritonitis; neither does the injection of bacteria and their toxins. Both are rapidly absorbed by the healthy peritoneum. There must be some injury to the cells of the living endothelium in order that the bacteria may find a place to grow and set up the tissue changes we call peritonitis. Such an injury may be produced by drying of the peritoneal surface, by rough operative traumatism, by irrigations of mercuric chlorid, from chemical substances extended from an unruptured abscess in the abdomen and by unsterilized bowel contents. Then, and only then, can there be produced a progressive peritoneal inflammation by the action of bacteria. Bowel contents are especially dangerous, because they not only act as foreign bodies and irritate the delicate endothelium, but also contain in them the bacteria necessary to use this injured area as a place for growth. They thus protect their contained germs from rapid absorption until they have a chance to grow. But the process is not dependent in any way on the chemical compounds of the bowel contents; it is entirely mechanical; blotting-paper infected with a blood culture of the germ would do as well. When an abscess ruptures into the peritoneal cavity it carries in the discharged pus the necessary elements for a spreading infection—the bacteria and their toxins in large quantities, hidden in solid particles of fibrin and necrotic tissue which act as a protection until an inflammation can be started in the as yet uninjured peritoneum. In those cases in which there has been

sufficient trauma during the course of an operation, the simple presence of bacteria will start an active process in the weakened peritoneal coat, and there is no need of foreign particles to protect the germ from absorption. The classification of acute peritonitis should be based on the bacterial infection, because on the nature of the infecting organism depends the symptoms, course and prognosis of the disease.

The classic picture of general peritonitis offers but slight interest to the doctor. The drawn-up knees, the swollen abdomen, the anxious, shrunken face are but indications that the time for all treatment is past. The whole aim of the doctor should be, therefore, to make the diagnosis and to attack the disease before the system has been poisoned beyond all hope of recovery. To do this requires more than the mere observation and weighing of the ordinary symptoms. It requires the ability to judge the patient's expression, to recognize the gravity of the situation, irrespective of the exact temperature and number of pulse beats. The early cases vary much in the severity of these symptoms, depending on the suddenness of the infection, its bacterial nature and whether the process is local or general. When there has been a perforation of one of the hollow viscera and a large quantity of infectious material has been distributed about the peritoneal cavity, the rapid absorption of bacteria and toxins cause a profound shock to the system, and may even cause the death of the patient in a few hours. Should this not occur, then the patient goes on either to general peritonitis or to a localized abscess with encapsulation of the material which has escaped from the perforation.

The symptoms in the first stage will be extreme and sudden pain, at times general, at other times localized at the point of perforation or referred to the epigastrium. The prostration will be marked, the pulse feeble, the skin cold and clammy. Tenderness on deep pressure may be marked over the site of the rupture or may be entirely absent. There is only rarely general tenderness over the abdomen; this is rather a later symptom, depending on the beginning of the active inflammation, and often does not occur until 8 or 12 hours after the perforation. No possible decision can be made at this time on the probability of the localization of infection, and delay only adds to the certainty that the patient's chances will become less the longer the period which elapses between the perforation and the operation for its closure. Cases in which there is a rupture of a localized abscess often show a remarkable improvement of the patient's subjective condition, due to relief of pressure on the nerve fibers of the abscess wall; but the rapid quickening of the pulse and rise of temperature point inevitably to the fact that an increase in the septic conditions is taking place. In other cases there may be absolutely no warning at the moment of perforation and the beginning of the process of generalization, and this most often occurs with gangrenous inflammation of the appendix. It is here quite natural to suppose that the nerve fibers of the organ are involved in the necrotic condition of the rest of the tissues, and that surrounding peritoneum, already inflamed by chemical exudation of the appendix. In these early cases of peritonitis, unless there be a clear history of previous trouble, the diagnosis often has to be made on a very slight basis. The temperature may be low, not over 100 F. very

often, with a pulse of 80 to 100, and only slight tenderness and distention of the abdomen; yet the patient has an indescribable, anxious, pinched look about the face that will enable a good observer to make a probable diagnosis. The most valuable symptoms are the pulse and the condition of the abdomen. The pulse in many of the well-advanced cases is peculiar, but easily recognized after a little experience. It is increased in frequency to 110 to 130 and is a little hard and snappy. The abdomen is tender, with a point of greatest sensibility at the place where the disease began, though in exceptional cases the most tender spot is on the side of the abdomen away from the point of origin. The abdominal muscles are rigid in the reflex attempt to protect the painful viscera beneath, and there is a marked distention due to paralysis of the muscular coats of the intestine by the poison, and possibly several other factors, the infiltration of the wall of the gut by the inflammatory products and also the irritation of the inhibitory nerves. Chilly feelings are a common symptom; but actual chills are rare, except in the puerperal form, when a severe chill frequently marks the beginning of the disease. In the latter type of infection, diarrhea is frequently present; instead of the usual obstinate constipation. Vomiting is an important and early symptom, often beginning before pain or tenderness, and thus indicates its origin from the irritation of the peritoneal nerves. Later it assumes the characteristic form seen also in cases of intestinal obstruction from any cause; the quite constant regurgitation of the contents of the stomach into the mouth without any effort on the part of the patient. Finally the fluid becomes the true stercoraceous vomit, and is a symptom of the final stages of the disease. Such cases are rarely saved by any means, operative or otherwise.

In conclusion, you will see that the diagnosis of peritonitis is not always clear at first, but, as a rule, can be made early from the history and sudden onset of symptoms.

SOME OF THE DANGERS OF PROLONGED ANESTHESIA.*

CLYDE A. FINLEY, M.D.

Formerly Instructor in Diseases of Women at the New York Post-Graduate Medical School and Hospital.

GALESBURG, ILL.

All anesthetics are drugs, capable of producing profound toxic symptoms endangering comfort, health, or life, according to the amount administered. I have divided the dangers into three classes—dangers to comfort, dangers to health, and dangers to life—and shall confine my discussion to the use and abuse of the two chiefly used anesthetics—ether and chloroform.

Regarding the dangers to comfort, the period of discomfort following anesthesia should be very short, not lasting more than a few hours. Perhaps a slight amount of nausea or one or two attacks of vomiting are sometimes unavoidable. Thirst should not be prominent. Food should

* Read at the Semi-Annual Meeting of the Knox County Medical Society, Sept. 16, 1909.

be craved within twenty-four or thirty-six hours. Headache, backache, or gas-pains should not occur. Instead of this the opposite extreme altogether too frequently prevails. Instead of lasting for only a few hours, the discomfort is extended for a period of several days, or a week in some cases. The nausea is profound and the vomiting is persistent, continuing so long as there is fluid in the stomach, and then producing a greater degree of discomfort by retching and gagging until there is marked exhaustion. Thirst is burning and almost unquenchable, and any fluid taken into the stomach for its relief is promptly expelled. The thought of food is repulsive. Headache is severe, and pain in the back is so severe that it is often the cause of the greatest complaint. Gas-pains are very troublesome and distressing; and often belching, with the odor and taste of the anesthetic, is present well on into convalescence. All these conditions taken together make about as complete a picture of physical misery as one can witness. And it is for this very reason that patients are so frequently heard to remark that if they had known the distress they would have to experience they would never have been operated upon. And it is also largely responsible for the lay prejudice against surgery which the profession has striven so long and so hard to overcome. It might be well to add here that this condition is not different from any other principle in medicine or surgery; remove the cause and the symptoms will disappear. As soon as surgeons so conduct their operations that this discomfort will largely disappear they will find that very soon the prejudice of the laity will to a great extent be overcome.

Regarding the dangers to health, ether especially is an irritant to the respiratory tract, to the digestive tract, to the urinary tract, and to the circulatory system. It very often stirs up an old bronchitis, gastritis, nephritis, or endocarditis, producing an acute attack for the patient to battle with during convalescence. One of these acute attacks is not infrequently produced even where the chronic condition has not existed. In the respiratory tract, pneumonia may also be mentioned as one of the prominent dangers either from irritation or inhalation. If the attacks are severe, they tax the patient to the utmost to recover, and are a source of considerable worry and extra work on the part of the surgeon. If they are not very severe, as a rule not much attention is paid to them, though they are apt to persist for a long time after the patient has returned to the family physician. It is probably because the surgeon sees them for so comparatively short a time that so little impression is made on him. If he were always to continue treatment until the general health is restored, more care would be taken to see that not sufficient anesthetic is used to produce these conditions.

The greatest dangers, of course, are those to life, and it is these dangers I shall speak of more in detail. As a rule, the safety of the patient while on the operating table is fairly well looked after and precaution taken against accident while the operation is being done, so that death on the table is of comparatively rare occurrence. The dangers to the respiratory, circulatory, and urinary systems I have already mentioned as menaces to health. Anesthetics are capable of producing lesions in any one of these systems sufficient to cause death; such as pneumonia, edema of

the lungs, cardiac dilatation or exhaustion, suppression of urine with consequent uremia, or acute nephritis. But I wish to take up two conditions about which comparatively little has been written and which in a great many cases are not recognized.

The first is hepatic toxemia. It is almost always preceded by the administration of chloroform, though it has been seen following ether anesthesia. The patient usually does very well for a period of twelve to forty-eight hours, when there is a sudden development of delirium, usually of the type in which fright is a prominent feature, and the pulse begins to increase in rapidity and decrease in strength. A slight jaundice may appear. These symptoms increase until death occurs, usually twenty-four to seventy-two hours later. The temperature remains normal until near the end, when there is a sudden rise. I have been able to find the report of but one recovery from this condition. Bevan reports a fatal case and cites twenty-nine others reported by various surgeons. Autopsy findings show nothing beyond fatty changes in the liver, and Bevan, after an exhaustive study, declares the cause of death to be hepatic toxemia, and concludes that the danger of this complication arising is in direct proportion to the amount of chloroform administered during the operation.

The other condition I shall speak of is intestinal paralysis. I have never heard it discussed in meeting and can find very little literature about it. I have seen it only after the administration of ether. At any time within thirty-six hours the abdomen begins to distend. There is no or only slight rise in temperature or pulse. The bowels lose their normal gurgle, and the sounds emitted from the intestines are metallic. Peristalsis is completely inhibited. If enemata are given they are usually retained. Very little gas escapes if a rectal tube is passed. The condition is usually mistaken for an infection followed by general peritonitis, and for that reason I am inclined to the belief that it is of much more frequent occurrence than is commonly supposed. I have witnessed a number of autopsies on cases in which the cause of death was supposed to be general peritonitis following a laparotomy, but no evidence of an inflammatory process was present in the peritoneal cavity, though the distention was sufficient to stretch the skin over the abdomen until it glistened. The condition should not be mistaken for general peritonitis, for about the only symptom they have in common is distention. There is no sensation of chilliness. There is an absence of rise in temperature or pulse in the early stages. The facial expression always found in peritonitis is never present. There is no vomiting. Distention may become sufficient to embarrass respiration, thus producing more or less cyanosis. If this stage is reached there may be an increase in the pulse rate. The usual cathartics and laxative enemata are ineffective. Eserin salicylate, hypodermatically, produces no result. Just preceding death the temperature, pulse, and respiration rise. Death occurs in from three to six days and seems to be due to autointoxication and respiratory paralysis. Fortunately the mortality in this condition is not so high as in hepatic toxemia.

The question as to who is to blame for these conditions naturally arises. The surgeon is inclined to blame the anesthetist, and the anes-

thetist wants to put the responsibility on the surgeon. In a recent number of *The Journal of the American Medical Association*, a Saratoga surgeon places on the anesthetist the entire blame for the dangers from anesthesia. But his article goes on to show that it is the incompetent anesthetist of which he is speaking. The very fact that a surgeon will employ an incompetent or inexperienced anesthetist places the blame, in that case, on the surgeon himself. And for my part I believe that most of the blame in all cases rests there. The fact that the dangerous elements of anesthesia are exhibited in cases in which the anesthetist is an expert should clear the latter of blame. All he can do is to administer the anesthetic in a skilful manner and continue it until the operation is completed. The surgeon certainly is to blame for the length of time during which an anesthetic is necessary, and the longer the time the greater the amount of anesthetic used.

The situation certainly should be remedied, and the only remedy lies in shortening the time used in the accomplishment of the necessary steps of operation. Time should not be wasted after the patient is anesthetized. Nor should more time be wasted after the operation is begun by attempting to follow unfamiliar methods simply because the surgeon has read or heard of them, when he is familiar with some method that will accomplish the same result. One great trouble with the surgeon is that he forgets that he is not the chief factor in any case. He forgets that there is such a thing as Nature, and attempts to remove all traces of disease himself and leave nothing for Nature to do. He should not hinder or confuse himself with a multiplicity of instruments. He should not hurry. But he should be ready to begin the operation as soon as the patient is anesthetized. He should perform only such details as are necessary and should follow only the methods with which he is familiar. He should remember that he is only the assistant of Nature and should do only those things that will aid Nature in overcoming the disease. His instruments should be few. He should operate quickly, making it necessary for the patient to receive only a minimum of the anesthetic. Every move should be for some definite object, and should accomplish something definite for the completion of the operation. He should not "piddle," as is too often the case. The average operation should be completed in from ten to eighteen minutes. The more difficult ones may require from thirty to forty-five minutes. In but one case have I ever found it necessary to prolong an operation to fifty minutes. According to Morris, many appendicitis operations, even with complications, should be completed in five minutes; stomach and bowel resections, or breast amputations requiring about thirty minutes.

When surgery is done in this manner, the discomfort following operations will practically disappear. Health will be restored instead of being so frequently injured, and deaths will not be traceable to an overdose of some anesthetic.

ILLINOIS MEDICAL JOURNAL

THE OFFICIAL ORGAN OF THE ILLINOIS STATE MEDICAL SOCIETY

GENERAL OFFICERS 1909-10

PRESIDENT - JONATHAN L. WIGGINS, EAST ST. LOUIS
FIRST VICE-PRESIDENT - CLIFFORD U. COLLINS, PEORIA
SECOND VICE-PRESIDENT - - JAMES E. STUBBS, CHICAGO
SECRETARY - - - - - EDMUND W. WEIS, OTTAWA
TREASURER - - - - EVERETT J. BROWN, DECATUR
(Ex-officio Clerk of the Council.)
EDITOR - - - - - GEORGE N. KREIDER, SPRINGFIELD
522 Capitol Avenue.
ASSISTANT EDITOR - GEORGE EDWIN BAXTER, CHICAGO
4603 Evanston Avenue.

THE COUNCIL

CARL E. BLACK, JACKSONVILLE. — J. WHITEFIELD SMITH, BLOOMINGTON.
H. C. MITCHELL, CARBONDALE. — J. Q. ROANE, CARLYLE.
M. L. HARRIS, CHICAGO. — J. W. PETTIT, OTTAWA.
J. F. PERCY, GALESBURG. — J. H. STEALY, FREEPORT.
W. K. NEWCOMB, CHAMPAIGN.

FEBRUARY, 1910.

COUNCIL OFFERS AID TO STATE BOARD OF HEALTH.

At a meeting of the Council of the Illinois State Medical Society held at Springfield, Thursday, January 6, the following action was taken on the matter of the suit of the National Medical College of Chicago against the State Board of Health. It will be remembered that a mandamus suit was brought by the National College to compel the State Board of Health to recognize its diplomas and a personal damage suit against the members of the Board. The full importance of the action of the Council of the State Medical Society may appear later. "It is moved by M. L. Harris and seconded by J. W. Pettit, that this Council offer to the Illinois State Board of Health any assistance within our power in the action brought by the National Medical College against the State Board of Health."

THE MONUMENT DEALERS OF ILLINOIS ORGANIZE.

Still another one of the branches of trade represented in our state has found it necessary to organize and protect itself from the fraud and grafter who seems now to permeate every branch of society and business.

The first meeting was recently held in Springfield. Possibly when all the various professions and trades become organized it will be possible to do something toward eliminating the undesirables. Certainly under present circumstances it seems impossible for society to entirely rid itself of the charlatan, which is usually only another name for criminal. In addressing this new organization Mr. Burke Vancil, a prominent attorney in Springfield and also interested in a local monument works, expressed some wholesome sentiments as follows: "I congratulate you, gentlemen, upon the stand you have taken to rid the country of the irresponsible so-called monument dealers. In order to succeed you must see to it that it means something to be a member of this association. If you do, the time will come when no one will think of placing an order with anyone but a member of the Illinois Retail Monument Dealers' Association. You must harmonize your business with the principles of this association and keep it in harmony. Why is the tombstone man so often classed with the lightning-rod man, the book agent, the patent-right man, the quack, and, yes, the shyster, and all the other bugbears of the commercial world to-day? It is because of the vampires and tramps in the business, together with a few dealers now and then who are crooked. The crooked dealer has demoralized the trade to such an extent that the legitimate dealer is nearly always classed with him. We must, therefore, absolutely disown the tombstone tramp and the crooked dealer, one is as bad as the other, and let the public know that the members of this association stand in a class by themselves. It makes my blood boil when I think of the lying deceits of the world of business to-day. Ours is not the only business, by any means, gentlemen, that is infested with the blight of falsehood and deception. Look to your own laurels, business men and all of you. What are you doing to drive out of your business the man who steals from his customers? I gladly welcome, therefore, an organization not only committed to the eradication of the dishonest dealer, but also determined to strike a death blow at grafting by those in a position to influence the letting of contracts for monumental work. Gentlemen, if your work will sell on its merits as it should, you have no business keeping on your pay rolls the executors, administrators, undertakers and sextons of your community. Leave that to your crooked competitor.

"Hear me, gentlemen. Do you know that the most valuable asset in your business to-day is the confidence and faith of your customers in your integrity? See to it that you do not betray that confidence. Our customers are at our mercy always, and they will soon learn to trust us instead of the unscrupulous tramp or dealer who is ever on the move, has no permanent abiding place, who pays no taxes, has established no credit in the community nor earned an honest name in the business world."

MORE ABOUT MEDICAL EDUCATION IN ILLINOIS.

In our December issue appeared an editorial on the subject, "Illinois and Rotten Medical Education," in which was quoted resolutions passed by the Southern District Medical Society. In the "Advance Sheet" of the December *Bulletin of the Illinois State Board of Health* a very lengthy article appears in defense of the present system. In another part of this issue appears a communication from Dr. Carl E. Black, chairman of the Judicial Council of the Illinois State Medical Society, which we recommend to our readers as good food for thought. We will make further comment in a later issue.

TRIANGULAR COMMITTEE ON TEMPERANCE INSTRUCTION.

As the result of a discussion at a recent meeting of the school teachers of Illinois, a triangular committee, composed of members of the W. C. T. U., the Illinois State Teachers' Association and the Illinois State Medical Society, has been appointed to formulate some common line of action for the future of temperance instruction in the schools of the state. This appointed committee is to make its report at the next meeting of the State Teachers' Association, to be held in Springfield in December, 1910. The committee will hold its first meeting in Chicago at the call of the chairman, Mrs. Ella Flagg Young. The following is the personnel of the committee:

W. C. T. U.—Mrs. Mary Kuhl of Chicago, chairman; Mrs. Harriet Darling of Aurora, Mrs. Mary Brumbach of Odell, Mrs. Minnie C. Horning of Evanston.

State Teachers' Association.—Mrs. Ella Flagg Young of Chicago, chairman; Dr. John G. Coulter of the Illinois Normal University, Mrs. Ella H. Mattice of Aurora, and Prof. J. D. Armstrong of Chicago.

State Medical Society.—Dr. J. L. Wiggins of East St. Louis, chairman; Dr. N. S. Davis of Chicago, Dr. J. W. Pettit of Ottawa, and Dr. J. F. Percy of Galesburg.

REPORT OF COUNCIL

Illinois State Medical Society.

Council met in regular quarterly session in the city of Springfield, Jan. 6, 1910, at 10 a. m., at the St. Nicholas Hotel. There were present Chairman Black, Councilors Harris, Pettit, Newcomb, Percy and Secretary Weis. By invitation Editor Kreider, Assistant Editor Baxter, Harold N. Moyer, Stephen C. Glidden and A. M. Miller.

Treasurer Everett J. Brown presented his general report for the year 1909 with vouchers attached; also two certificates from the National Bank of Decatur certifying to the cash balance to the credit of the treasurer

in said bank. The report, vouchers and certificates were referred to the auditing committee appointed by the chair, consisting of Harris, Pettit and Newcomb. Said committee reported that the accounts were correct, which report, on motion of Percy and seconded by Weis, was approved. Treasurer Brown also submitted a report of the financial condition of the Medicolegal Defense Committee.

Chairman S. C. Glidden, on committee of arrangements, and Dr. A. M. Miller, a member of said committee, here addressed the Council, making a verbal report of the work done by the committee in relation to the annual meeting. They stated that their desire was to send out two circular letters of notice to the profession generally, and further reported that they had not as yet decided upon the exhibition hall, but would do so in the very near future. They were urged by the Council to make a choice consistent with the needs of the regular meeting at the earliest possible moment. The report upon motion was received.

Chairman Moyer of the executive committee of the Medicolegal Committee reported to a motion adopted by the preceding council requesting him to furnish data and a recommendation as to the advisability of increasing the per capita tax to cover judgments. Chairman Moyer spoke exhaustively on all phases of the subject. He entered into the closest detail, showing that he had given the matter a great deal of thought and attention.

Many questions were asked and answered, and finally it was moved by Pettit and seconded by Percy that Dr. Moyer be instructed to formulate his ideas and suggestions relative to the above-mentioned subject and to present the same to the next House of Delegates.

The secretary presented a letter of Mr. George B. Mills, of Evanston, chairman of the Committee on U. S. P. and N. F. Propaganda of the Illinois Pharmaceutical Association in which it was solicited to combine the work of this propaganda in a measure with that of our Lecture Bureau. After thorough discussion it was thought best for the present that the secretary be instructed on motion to not affiliate at the present time with this committee, and to so inform Chairman Mills.

Councilor Harris now gave the Council the result of his experience with the new order of things connected with the postage on second-class matter, which experience came to him as trustee of the A. M. A. Action was deferred until the necessity therefore arose.

Chairman Black brought to the attention of the Council the fact that the Illinois State Board of Health and its members individually were being sued by the National Medical College of Chicago for the purpose of compelling recognition; and it further being thought that the Illinois State Medical Society, through and by its Council, could be of some use to the defendants, it is moved by Harris and seconded by Pettit that this Council offer the State Board of Health any assistance within our power in the action brought by the National Medical College against the State Board of Health. Carried.

George Edwin Baxter, Assistant Editor, presented a financial statement of moneys collected by him from advertisements, which, upon

motion, was referred to the auditing committee. Said committee, after examining, reported the same to be correct, whereupon it was moved by Percy and seconded by Weis that the report of the committee be approved. Carried.

Upon motion, adjourned to meet at the call of the chair. Adjourned.

E. W. WEIS, Secretary.

Correspondence.

DR. STANDARD MAKES CORRECTION.

CANTON, Ill., Jan. 20, 1910.

To the Editor:—In looking over the last number of THE ILLINOIS MEDICAL JOURNAL I found a notice stating I had come to Canton to be Medical Superintendent of the Graham Hospital. This is not correct and I do not have any idea as to the origin of the notice. It has caused me a great deal of inconvenience and I would be very thankful if you would correct it in your next issue of THE JOURNAL. I came to Canton for the practice of general surgery, and do not have anything to do with the management of the hospital. Thanking you in advance for this favor, I am

Very truly,

A. P. STANDARD, M.D.

MEDICAL EDUCATION IN ILLINOIS.

Mr. Editor:—This communication assumes that your readers are familiar with the editorial in THE ILLINOIS MEDICAL JOURNAL, December, 1909, p. 723, entitled "Illinois and 'Rotten' Medical Education," in which is quoted a resolution adopted by the Southern Illinois Medical Society at its last annual meeting (Nov. 4 and 5, 1909), held at East St. Louis, and that they are also familiar with a pamphlet of twelve pages published as "Advance Sheets," *Bulletin of the Illinois State Board of Health* (circulated at the expense of the people of Illinois) issued (dated Dec. 31, 1909) about Jan. 22, 1910, containing a communication of the officers of the Board of Health, entitled "Illinois a Plague Spot in Medical Education, Medical Examination and Medical Licensure."

The reason for making any answer to the statements of the officers of the Board of Health is the same that inspired the Southern Illinois Medical Society in unanimously adopting the resolution, namely, dissatisfaction with results obtained in medical education, examination and licensure in this state. As citizens who desire to have our state occupy a leading position in all that goes to prevent disease, cure sickness and allay suffering and to have those licensed to do these things possess the most approved qualifications, we find it difficult to understand why the third state in the Union in population and importance should be placed in the

lowest rank in these respects, and this in a state containing several of the best medical colleges in the United States. Naturally the presence of such schools should elevate the average.

To adopt a resolution asking our officials why our fair state is behind her sister states in these matters would hardly seem the occasion for impugning the motives of either individuals or societies. There may be good and sufficient reasons for the present conditions, and the resolution merely asks the Board of Health to explain.

I have no reply to make to the personal attack and I have no personal criticism of any officer or member of the State Board of Health.

It was my privilege to accept an invitation to be the guest of the Southern Illinois Medical Society at the meeting above referred to and to read a paper on a subject having no connection with the matter of the resolution in question. This meeting was one of the most largely attended which this old and active organization has ever held, and at the time the resolution was presented there was a large attendance. The question of medical education in Illinois was brought out by Dr. J. L. Wiggins, President of the Illinois State Medical Society, at a dinner given to members of the Southern Illinois Medical Society. He introduced the subject by explaining that there had been a great deal of criticism of the standing of Illinois in matters of medical education and licensure and that the Secretary of the Board of Health was largely held responsible for existing conditions. He said that he thought the profession in general was much in the dark regarding these matters and he requested me to explain the situation. As far as I was concerned this was entirely unexpected and impromptu, but I stated briefly a few of the reasons, as they appeared to me, for dissatisfaction with the results obtained by the present executive officer of the State Board of Health. Later I found that it had been the plan of Dr. Wiggins and other members and officers of the society to have the Secretary of the Illinois State Board of Health present and ask him to answer certain questions in open meeting, but at the last minute word was received announcing his inability to be present on account of serious illness in his family. There was considerable discussion among the individuals of the Society regarding the failure of their plan, and after consultation among Dr. Wiggins of East St. Louis, Dr. Hamilton of Mt. Vernon and others it was decided, since no officer or member of the State Board of Health was present to answer questions, to present a resolution calling upon the board for an explanation of certain criticisms of medical education in Illinois. Upon request of Dr. Wiggins, I prepared the resolution in question, which Dr. Hamilton of Mt. Vernon presented, and at the time I have no doubt that he had a sincere desire to aid the cause of better medical education and to impress upon the Board of Health the necessity for more care in issuing licenses.

In this country of democratic institutions it is the privilege of the individual and the organization to ask public officials for information and explanations, and the acts of such officials are at all times the legitimate subject of honest discussion, and it is in this spirit that this communication is written. The public is vitally interested in maintaining good professional standards, and no amount of personal abuse should

deter us from demanding a full explanation of why our state should hold the position in medical education which she now occupies. One would think the progressive official would be glad to supply such information even before it is requested.

It is greatly to be deplored that the officers of the Illinois State Board of Health are unable, after eleven years of control of the department which is charged by law with the duty of determining what medical colleges are in "good standing" and what graduates should be admitted to practice, to give a satisfactory explanation of why Illinois should be published to the world as a "rotten spot" in medical education.

In brief, it is the duty of the Illinois State Board of Health to determine that the applicant for license is 21 years of age; is of good moral character; has had the necessary preliminary education; has a diploma from "a medical college or institution in good standing, as may be determined by the board," and has taken an examination properly conducted by the board in "those general subjects and topics, a knowledge of which is commonly and generally required of candidates for the degree of doctor of medicine, by reputable medical colleges in the United States."

The reader will be interested in the following quotation from the report which Dr. A. D. Bevan, chairman of the Council on Medical Education of the A. M. A., made to the Association on June 4, 1906: *"It is evident from a study of the medical schools in this country and their work that there are five specially rotten spots which are responsible for most of the bad medical instruction. They are Illinois, Missouri, Maryland, Kentucky and Tennessee."—The Journal,* A. M. A., June 16, 1906, page 1853.

In the "Advance Sheets" referred to, there is a quotation from the published remarks of "a prominent medical educator" and a certain "essayist," in which the language is identical with that used by the Council on Medical Education in its report. It would have been more creditable to the officers of the Board of Health to have stated frankly that the "prominent medical educator" and the "essayist" were in reality the chairman of the Council on Medical Education, and that the language quoted was from its official report to the American Medical Association. It is plain that the weight of authority carried by such a report made it desirable to suppress the source of the language quoted.

This was not a mere statement of belief on the part of the Council on Medical Education, but is the result of a careful and painstaking investigation of the conditions in all states and is accompanied by comprehensive tables setting forth the details on which the statement is based. Every Illinois physician interested in the cause of medical education and licensure should study these reports of the Council on Medical Education and of his own knowledge decide whether he is satisfied with conditions in his state. While it wounds our pride to find our state has fallen behind in these matters, it is very important that all should recognize the situation in order to inaugurate proper corrective measures.

There is this to be said in defense of the present conditions: Recent progress in medicine has been so rapid as to be almost revolutionary and

it has required far-seeing and astute leaders to keep any state from falling behind. We are passing through a transition from medical schools established and maintained for the profit of members of the faculty and others, either directly or indirectly, to schools managed with an eye single to the quality of instruction and laboratory and clinical facilities for proper teaching. It has required officials possessed of a strong professional sentiment, fostered and led by high ideals, and prompt and resourceful initiative to place medical education beyond the reach of commercial and political influences. In the days of the late John H. Rauch, Illinois had such a leader and our state was in the front rank in medical education. In the absence of such leadership, we have steadily lost ground to the extent indicated by the above quotation from the report of the Council on Medical Education.

The law makes it the duty of the board to determine whether our medical colleges are in "good standing," that is, whether they have a faculty, buildings and equipment capable of giving a proper medical education, and the resolution simply asks why the board in Illinois has failed to do its plain duty under the law. If there are good reasons, it is no act of unfriendliness on the part of the people to ask for them.

Regarding examination and licensure in Illinois, the statistics from the Council on Medical Education show that in 1906 the states of Indiana, Kentucky, Missouri, Iowa and Wisconsin (bordering on Illinois and having identical conditions of population) collectively only examined 21 per cent. more applicants than Illinois, while they have a combined population 150 per cent greater. In Illinois the failures in the 1906 examinations were 8.4 per cent., while in the five states mentioned the failures were 25 per cent. That is, of those examined in these five states, 200 per cent. more failed to pass than failed before the board in Illinois, where the examinations were conducted by its Secretary. That this is not accidental for 1906 is shown by the fact that if we take the years 1903 to 1906, inclusive, the five states above mentioned examined 9 per cent. fewer applicants than were examined in Illinois alone, and of those examined the failures in Illinois were 5.9 per cent., while the failures in the other five states were 18.5 per cent.; that is, there were about 200 per cent. more failures in the five states mentioned than in Illinois during the four years.

In 1906 Illinois alone sent out 27 per cent. of all physicians registered under reciprocity in the United States, while she received only 6 per cent. In other words, Illinois sent out through reciprocity 300 per cent. more than she received. Is it possible that the low percentage of failures in examinations conducted by the Secretary of the Ilinois board has anything to do with this discrepancy in medical immigration?

In explanation of this rush of graduates to be examined by the Illinois board, it has been suggested that Illinois sends out more graduates and naturally they are examined in the state where they graduate and then seek their locations under reciprocity. Let us see.

If we compare Illinois with Pennsylvania, New York, Maryland, Tennessee, Missouri, Ohio and Massachusetts, the seven states having the

next highest number of graduates, we find that these states had 300 per cent. more graduates examined at home than Illinois, but that the seven states combined furnished 23 per cent. less licentiates to register under reciprocity than did Illinois. In this connection it may be of interest to note that of Illinois graduates examined by the Secretary of our state board only 5 per cent. failed, while of the graduates of the seven states mentioned examined at home 15.5 per cent. failed—200 per cent. more than in Illinois. Any one interested can look up the figures on which these percentages are based. They are offered as a reasonable explanation of why the Southern Illinois Medical Society was well within, not only its rights, but its duty to its communities, in asking the Illinois State Board of Health to explain "why Illinois should bear the stigma of being one of the plague spots in this country in medical education."

JACKSONVILLE, Ill., Jan. 28, 1910. CARL E. BLACK.

THE ANNUAL MEETING OF THE STATE SOCIETY.

DANVILLE, Ill., Jan. 14, 1910.

Dear Doctor:—The Vermilion County Medical Society desires to call your attention to the State Medical Meeting in Danville, May 17, 18 and 19, 1910. Bear in mind this is to be the Sixtieth Annual State Meeting of your society. Careful attention is being given to every detail to make this the best in its history.

To make it so we need the cooperation of every member. We want yours!

If any medical gentleman of your acquaintance does not belong to your local society—without which he cannot become a state member—take an application blank and induce him to sign it. Then bring him along.

Welcome to Danville.

Fraternally yours,
STEPHEN C. GLIDDEN, General Chairman.
A. MERRILL MILLER, Chairman Publicity Committee.

VISITS TO SURGICAL CLINICS IN ENGLAND AND SCOTLAND.

THIRD LETTER.

NELSON M. PERCY, M.D.

Junior Surgeon to Augustana Hospital; Attending Surgeon to St. Mary's Hospital; Instructor in Surgery, College of Physicians and Surgeons.

CHICAGO.

VISIT TO MR. MORISON'S CLINIC, NEWCASTLE-UPON-TYNE.

Surgery of the Gall Bladder.—To reach the gall bladder Mr. Morison makes a transverse incision, beginning in center of right iliocostal space and extending upward and inward to edge of right rectus muscle. All the muscles are cut squarely off. The reasons given for this incision were

that it gives best access to the gall bladder and common duct; that the other abdominal organs are not brought into the field of the operation so much, and that it is safer in septic cases, because the drainage is directly downward and backward, and not up through the abdomen. I was told that a hernia has never resulted through such an incision. A rubber tube is employed for drainage. In cases of simple gallstones, the cystic and common ducts being normal, the gall bladder is not drained, but is closed with a purse-string suture.

Pancreatitis.—Mr. Morison believes that in every case of marked pancreatitis there is a small stone lodged in the ampulla of Vater. This stone cannot, however, always be found at the time of operation. He asserts that he has found it in many cases, but in two cases a stone was found at post-mortem, after a careful search at the time of operation had resulted in failure.

Hernia.—After the hernial sac has been thoroughly loosened, a pair of curved hemostatic forceps is passed inwards through the external oblique and internal oblique muscles at a point about 7 cm. above the internal inguinal ring. The fundus of the hernial sac is grasped by the forceps and the hernial sac pulled upwards and brought out through the abdominal muscles and sutured to the external oblique. The rest of the operation is completed by the Bassini method.

Carcinoma of the Tongue.—In carcinoma of the tip of the tongue he made an excision of the distal one-half of the tongue, and in a case of carcinoma on the side of the tongue made excision of one lateral half of the tongue, and in both cases expected to remove all the lymph nodes in both sides of the neck two weeks later.

Ulcers of the Face.—The following point in diagnosis was made. Tubercular and specific ulcers nearly always appear near the middle line of the face and forehead where there is the least blood supply. Carcinoma is just as likely to appear in the vascular as in the non-vascular areas.

Myoma of the Uterus.—I saw several of these cases, and they were operated very well. I also saw many cases of ovarian cysts.

Psoas Abscess.—The incision was begun a little below the anterior superior spine of the ilium and continued upward along the crest of the ilium, cutting through all the muscles down to the peritoneum. The latter was pushed forward and the abscess freely incised. The abscess cavity was sponged thoroughly with dry gauze, removing all pus and shreds of tissue. A small piece of bone is usually found in the cavity and removed, as was done in the case which I saw. When the abscess cavity is perfectly dry, the wound is closed completely without drainage. The cavity becomes obliterated and never refills, but occasionally a superficial tuberculous infection of the skin occurs. Mr. Morison and Mr. Turner both said that the results are very good. Two cases were presented, one two months and the other six months after operation. In each the result was perfect.

In ununited fractures and fractures which cannot be held in good position by splints, a bone clamp invented by Mr. Willian is used. A

description of this method will appear next month in the *Annals of Surgery.*

Congenital Stenosis of the Pylorus.—A baby, 10 weeks old, was brought in for operation, but its general condition was so bad that operation was postponed. The child died four hours later. Post-mortem examination revealed a hard mass completely obstructing the pylorus. The stomach was small and it was greatly thickened. Regarding the differential diagnosis in these cases, Mr. Morison made the following statement: "There is no other condition in infants which causes persistent vomiting and constipation. All other conditions which cause vomiting in babies also cause diarrhea."

VISIT TO MR. GREY TURNER'S CLINIC.

Mr. Turner is a most enthusiastic surgeon. He is a thorough pathologist and has collected and prepared a large museum of gross pathologic specimens which he uses in teaching gross surgical pathology in the Durham University located at Newcastle. His work is similar to Mr. Morison's, but more Americanized. He brought back and employs more American methods than any English surgeon who has visited America. His technic in gall-bladder work, in hernia operations and in the treatment of psoas abscesses is the same as that employed by Mr. Morison. Both he and Mr. Morison perform gastro-enterostomies without the use of clamps. They do not use the Connell stitch, but employ what is known as the "post-mortem stitch." The needle is passed from within out each time, and it seems to fold the edges in very well. It can be done quickly, and they believe it is certain to control all hemorrhage.

Carcinoma of Cervical Portion of the Esophagus.—Two weeks ago a gastrostomy had been made. Yesterday the carcinomatous mass was excised, including 7.5 cm. of the cervical portion of the esophagus. The lower end of the esophagus was ligated. The upper end was left open and the wound was drained very freely.

Idiopathic Dilatation of Sigmoid and Colon.—Patient aged 10 years. The enlargement and elongation were entirely confined to the descending colon and sigmoid. Mr. Turner excised the enlarged bowel, fifteen inches in length, closed both ends and made a lateral anastomosis without the aid of clamps.

VISIT TO MR. RICHARDSON'S CLINIC.

Mr. Richardson performed some very nice operations, one of which was especially interesting. He had operated upon a man for strangulated hernia eighteen months ago, at which time the intestine did not look at all bad. For the past twelve months the patient has had symptoms of intestinal obstruction. At the second operation, which I saw, two strictures, eight inches apart, were found in a loop of the ileum. One stricture was very tight and felt like a thickened contracted pylorus.

Retroverted Uterus.—Made median abdominal incision. Picked up round ligaments two inches from the uterus, cut them off at this point,

then pulled the proximal end up through the muscles of the abdominal wall and sutured to the external oblique fascia. He made no provision against the occurrence of intestinal obstruction which might occur by a loop of intestine getting caught around one of the round ligaments.

VISIT TO MR. STILES' CLINIC, EDINBURGH, SCOTLAND.

Mr. Stiles removed a pin which had lodged in the colon of a child at a point opposite the iliac crest. The old classification as to the division of the colon has been discarded by him. He does not recognize the word sigmoid colon. From the splenic flexure downward he divides the colon as follows: descending colon, iliac colon and pelvic colon. The iliac colon begins at the crest of the ilium, at which point there is a distinct angle in the gut. The pelvic colon begins at the pelvic brim, where there is another angle. It is at these two points at which foreign bodies are most likely to lodge.

Torticollis.—Mr. Stiles does the Robert Jones operation; that is, he simply divides both sternal and clavicular portions of the sternocleidomastoid muscle near their insertion and allows the ends to retract, controls hemorrhage and sutures the skin. He considers nearly all cases congenital, and doubts whether the rupture of the sternomastoid muscle during delivery is a common cause of torticollis.

Hernia.—All cases are operated on, children as well as adults. He prefers to operate at the age of five or six months. The reasons given were that many cases in children treated without operation recur in early adult life; the period of treatment is much longer without operation, and the children leave the hospital on the eighth day after operation. In infants the sac is simply excised high up. In older children the Ferguson operation is performed. No dressing is ever applied to hernial wounds. The arms and legs are fastened and a tent-like support is placed over the patient to keep the bed clothing away from the wound. I saw six of these wounds and they were perfect.

Congenital Dislocation of the Hip.—In a majority of cases a tenotomy of the adductor muscles is made about two weeks before reduction is attempted, which is done by the Lorenz method.

To Prevent Peritoneal Adhesions.—In abdominal cases in which a great many adhesions have been broken up, or if conditions are such that adhesions are expected to form, Mr. Stiles is using Wilke's vaseline oil. It is a bi-product of vaseline. Wilke has carried on an extensive series of experiments on rabbits with various oils and finds that vaseline oil is the only one which gives satisfactory results. Mr. Stiles has used it in a few cases, and apparently with excellent results. In cases in which he separates a great many adhesions, he pours about two ounces of this oil into the abdomen and with his fingers rubs it over the surface of the intestines in that area. Mr. Stiles said: "This is one of the good things which I wish you would take home with you." Mr. Wilke will have an article on this subject in *Surgery, Gynecology and Obstetrics* next month.

Anesthesia.—Mr. Stiles uses chloroform in young children, except in septic cases, for in these cases chloroform poisoning is apt to occur. His

results in septic abdominal conditions are very much better with ether than with chloroform. In adults he uses open ether entirely.

Undescended Testicle.—I saw Mr. Stiles perform three of these operations. He employs the Bevan operation, but seems to do it better than I have ever seen it done before. He is an excellent anatomical surgeon.

Clubfeet.—In most cases a tenotomy of the tendo Achillis and plantar fascia is done first. In bad cases over three years old a wedge-shaped piece of bone is removed from the astragalus.

Neuralgia of the Inferior Dental Nerve.—In this patient Mr. Stiles resected a portion of the inferior dental nerve, doing the operation through the mouth. If the patient does not object to the scar, he performs the external operation. When the internal operation is performed, Mr. Stiles disinfects the mouth for about four days previous to operation to prevent sepsis, which, when it does occur, is a very annoying condition.

Prostatectomy.—In case the prostate is large the suprapubic route is preferred, but if it is small and hard the perineal route is used. If the prostate is large and the bladder distended with a considerable amount of residual urine, Mr. Stiles does the Lynn Thomas combined operation, draining from below. He removed the largest prostate I ever saw. It was the size of an infant's head and weighed one pound and six ounces, had rotated upward, the upper end being wedged underneath the promontory of the sacrum. It was with considerable difficulty that the gland was dislodged from the pelvis. Drainage was established above and below.

Mr. Stiles is an excellent operator. He uses very sharp knives, and makes beautiful but rapid dissections. He protects the head and mouth, but wears gloves only in septic cases. In preparing the hands for operation, he washes them twice with a tincture of green soap to which some lysol is added. The hands are then washed with a solution of lysol, after which they are immersed in a ½ per cent. carbolic solution, which contains one ounce of glycerin to a quart of the solution. Lastly, they are washed with lysol and then with sterile water.

VISIT TO MR. ALEXIS THOMPSON'S CLINIC.

Mr. Thompson is a brilliant operator. In appendectomies he makes the incision lower down and nearer the anterior superior spine of the ilium than McBurney's point. He says that this incision is more often over the appendix than one through McBurney's point.

VISIT TO MR. CAIRD'S CLINIC.

Here I saw a gastrostomy for carcinoma of the esophagus. Local anesthesia was used with practically no discomfort to the patient. He performed practically the same operation that has been made at the Augustana Hospital for several years, except that the incision was made in the median line.

VISIT TO MR. WALLACE'S CLINIC.

I saw Mr. Wallace do some excellent work. In a case of carcinoma of the lower jaw he removed one-half of the jaw together with a portion of

the floor of the mouth, and removed all of the lymph nodes from same side of the neck. The dissection was beautiful, the operation was performed quickly and with very small loss of blood.

VISIT TO MR. GRAY'S CLINIC, ABERDEEN, SCOTLAND.

A case of polypus within the small intestines. The patient, aged 33 years, for the past three months had had symptoms of intestinal obstruction at various times. At operation an intussusception of three feet of the small intestine was found, and also a polypus the size of an English walnut was attached to the mucous membrane of the small intestine at a point ten inches distant from the apex of the intussusception. The latter was reduced and no gangrene was found. Four inches of the intestine, including the polypus, were removed. An end-to-end anastomosis was made, the first row of stitches being interrupted Connell stitches. Both ends of the intestine were cut obliquely, taking away slightly more on the outer than on the mesenteric side. In all such cases Mr. Gray gives eserin hyperdermically the day following operation to stimulate intestinal peristalsis.

Tuberculosis of the Testicle.—This patient had had one testicle excised six months before, at which time some tuberculous tissue was removed from the opposite side of the scrotum. A sinus had persisted, so now the remaining testicle was excised. Mr. Gray stated that "he has seen two cases of tuberculosis of the bladder complicating tuberculosis of the testicles in which the former condition subsided after castration." He offered an explanation as to why the kidney frequently becomes infected from a tuberculosis of the testicle. "The testicle is formed outside of the kidney and as it descends it brings its own lymphatics with it, making a direct lymphatic connection between these two organs."

Varicose Veins.—Mr. Gray uses the Babcock probe instead of the Mayo instruments. The vein is picked up above, cut off and the proximal end is ligated. The probe is inserted into the distal end of the vein and pushed downward to a point near the foot. An incision is made through the skin over the end of the probe, around which the vein is ligated. The vein is now stripped away, the procedure being carried out rapidly and with ease every time.

The Opsonic Index.—No effort is made to determine the opsonic index, but the clinical symptoms are used as the guide for the administration of tuberculin. Patients are vaccinated as a prophylactic measure before operations upon the mouth, and also before abdominal operations in which the intestinal tract is to be opened. In mouth cases mixed antitoxin for streptococci and staphylococci are given. In abdominal cases he administers an anticolon bacillus serum.

Lane Bone Plates.—Mr. Gray is very enthusiastic over the use of these metallic plates in cases of fractures and has used them frequently during the past 18 months. He said that it shortens the period of disability and does away with any permanent loss of function. So far he has not had to remove any of the plates.

A Case of Dysmenorrhea.—Varicosed veins were found in both broad ligaments. A section of each broad ligament was excised, thus disposing of the enlarged veins, and at the same time severing the nerve supply to the ovaries. His results from this procedure have been good.

Gastroenterostomy.—The posterior gastroenterostomy done with needle and thread is the operation of choice. The opening is always made in the pyloric end of the stomach. Mr. Gray has conducted a number of experiments upon the stomach, using bismuth, then making observations with the fluoroscope and also taking *x*-ray pictures. He does not believe in the theory that food prefers to pass through the pylorus in preference to a gastroenterostomy opening.

Acute Osteomyelitis.—Whenever possible a subperiosteal resection of the affected portion of the bone is made and the periosteal cavity is filled with bismuth paste. Several *x*-ray pictures of such cases were presented showing excellent results.

Handly's Lymphangioplasty.—This is performed in cases in which from any cause the lymphatic circulation has been blocked in the axilla or groin, resulting in edema of the extremity. A long probe-like instrument is inserted underneath the skin at the wrist (in case the arm is involved) and passed upward beyond the shoulder into the neck. A small incision is now made over the upper end of the probe to which five or six strands of fine silk are fastened. The probe is withdrawn, pulling the silk threads into the channel made by the probe. This silk is left in place and the two small buttonholes in the skin are sutured. Four or five such channels are made, being exceedingly careful as to asepsis. I saw two of these cases, and the results were quite satisfactory.

Breast Amputations.—The pectoralis minor muscle is used to cover up the axillary vein. The muscle is severed at its costal attachment and is held upward during the axillary dissection. When this is completed the muscle is stitched downward and backward around the vein. Mr. Gray did some very nice gall-bladder, appendix and pelvic work. He is an excellent general surgeon.

JENNER MEDICAL COLLEGE NOT AFFILIATED WITH GRACE HOSPITAL.

GRACE HOSPITAL (Incorporated), 308 S. Sangamon Street.

To the Editor:—The Jenner Medical College is running without hospital affiliation and has done so since December, 1909, the Grace Hospital having requested them to discontinue their clinics.

Yours truly, (Signed) M. D. BATES, Treasurer,
1605 Van Buren Street, Chicago.

THE FEE SPLITTING GAME.

We have received the following letter from a worthy practitioner, a member of one of our local societies, who does not wish his name mentioned in connection with the correspondence, and we therefore print it

anonymously with the hope that some of our members will discuss the matter from this point of view:

Jan. 18, 1910.

Dear Doctor:—I have been planning for a long time to write to you as editor of our journal in re the "fee splitting game" to give a point of view that has been overlooked in great measure, and if I am a little tangled in my argument you will pardon me because I am writing off-hand, extemporizing.

I represent in type the "average" practitioner. While I feel that the present method of charging is unfair to the family physician, who in most instances has made a worthy effort to make himself competent, I at the same time recognize that I have no business with the other fellow's charge and that he is entitled to all that he can get if he delivers the goods.

I (and in using the pronoun I am using it in the sense of the great bulk of country doctors) am not quarreling about a division of the fee. *I want to make my own fees,* I want when I die to leave something of an estate for my family. I do not want to work as hard I do now when I am sixty. The gentle and just art of getting good fees for *every-day work* is unknown to me. One dollar and a half a call and $1 for office consultations and $10 for obstetrics is the rut we are all in. I feel that I am rather well trained, certainly I have had the opportunity and spent enough money to get a training. But no where in all that time has any one told me how to look after my business. It is all very well for the teacher to tell the young artist about "scientific" blending of color, but what about the psychology of impressing the buyer as to the value of the service and the art of "asking the fee?"

I have received more practical and real help from a broken-down old quack whom I befriended in his last days than from all the teaching I ever heard. I mean in a proper way.

For instance, one point he taught me: He told me that when a man or woman came to the office for advice they were sick, or thought they were sick, which was the same thing from the patient's point of view, and that they were prepared to give up good money to be relieved, and that it was up to me to relieve them, and as quickly as possible. That I should take interest in the case and go over them, to "examine them;" take a little more time, etc., and to charge extra for it.

Now to the point of my letter. Why not interview some of our senior members who have accumulated $8,000 to $10,000 practices doing regular family physician's work? Tell us of the little niceties of the work; how they get two dollars instead of one; how they made it possible to accumulate such large incomes and yet be considered by their patients as charging reasonable fees.

I do not want to be considered as discussing the unusual fees. Most of us do not have appendicitis cases every day in the week. We do have our chronics, from headache to Bright's, etc.

If some one will only tell us how to improve our condition and utilize our possibilities as they exist every day, we will not be envious of the

"high brows" who get up in the society and talk ethics and generalities. I never did and probably never will receive $100 fee for any one consultation. What we want is to get just a little more out of each of our cases, and at the end of the year feel that we can afford at least a short vacation.

I hope you will interpret my meaning; I certainly have not expressed myself well. Help the "average man," the specialist has proved himself able to take care of himself. I don't want his money; it isn't on the square. I do feel that I am not appreciated and do not know how to improve myself.

Thanking you in advance, I remain, Yours truly, ———.

CHANGE OF LOCATION.

Dr. Hamilton, Galesburg, has removed to Alliance, Neb.

Dr. A. Hostetter has removed from Rockford to Mt. Carroll.

Dr. L. M. Bowman has removed from Alton to Snyder, Okla.

Dr. H. C. Kariher has removed from Seymour to Champaign.

Dr. J. Frank Friesen, Chicago, has removed to Buehler, Kans.

Dr. John Weir, Marshall, has retired from the practice of medicine.

Dr. G. W. Hochrein has removed from Topeka, Kans., to 3000 Indiana Avenue, Chicago.

Dr. C. F. Burkhardt has removed from Effingham to 215 Madison Avenue, Covington, Ky.

Dr. Ira W. Miller has removed from 1203 Wells Street, Chicago, to 70 Myrtle Street, Saybrook.

Dr. George A. Darnell has removed from Woodstock to 105 West Douglas Street, Wichita, Kans.

Dr. T. M. Dromgold has removed from 7011 Kimbark Avenue, Chicago, to 518 West Jefferson Street, Ottawa.

Dr. R. D. Cruikshank has removed from Boone and entered into partnership with Dr. N. L. Pollock at Danville.

COUNTY AND DISTRICT SOCIETIES.

ALEXANDER COUNTY.

The Alexander County Medical Society held a meeting Dec. 30, 1909, in the Commercial Club rooms, Cairo, Ill., and elected the following officers, all of Cairo, for the ensuing year: Dr. S. B. Cary, president; Dr. James M. McManus, vice-president; Dr. James W. Dunn, secretary-treasurer. The following board of censors was constituted: Drs. W. F. Grinstead, W. C. Clarke and G. H. McNemer. The committee on public health and legislation was named as follows: Drs. Samuel Dodds, J. W. Dunn and James M. McManus. After the election of officers a general discussion of matters pertaining to the welfare of the society was had, and several of the members related interesting personal experiences. The next meeting will be held on the fourth Tuesday in January, at which time Dr. E. E. Gordon will present a paper.

JAS. W. DUNN, Secretary.

BROWN COUNTY.

At the regular quarterly meeting of the Brown County Medical Society, held at the Court House in Mt. Serling, Ill., Wednesday, Jan. 5, 1910, the following officers were elected: Dr. D. W. Owens, Hersman, president; Dr. F. E. McGaun, Mt. Sterling, vice-president; Dr. Wm. Parker, Mt. Sterling, secretary-treasurer; Dr. J. G. Ash, Hersman, delegate to state convention; Dr. F. E. Gaun, Mt. Sterling, alternate; Dr. E. C. Allworth, Mt. Sterling, Council.

WM. PARKER, Secretary.

BUREAU COUNTY.

The thirty-second semi-annual meeting of the Bureau County Medical Society was held at the City Hall, Princeton, Thursday, Nov. 11, 1909, with W. C. Griswold, second vice-president, in the chair. The following members were present: M. N. Blackburn, M. J. Coverny, J. H. Franklin, O. J. Flint, W. C. Griswold, W. M. Kaull, A. E. Owens, H. M. Owens, A. S. Rummell, H. D. Steele, C. C. Scott, S. C. Mason and J. D. Trumbauer: Visitors: J. H. Bacon, Peoria; E. P. Cook, Mendota; A. G. Downer, Princeton, and E. H. Butterfield, Ottawa. The minutes of the preceding meeting were read and approved. The report of the secretary and treasurer for the preceding meeting were read and approved. Dr. Kaull reported for the committee on necrology on the death of Dr. C. A. Palmer and presented the following:

Charles A. Palmer, M.D., Chicago Medical School, 1876. A graduate of the Princeton High School, class of 1873. In the same year he began the study of medicine in the office of G. W. Crossley, of this city, and in due time entered Chicago Medical School, medical department of Northwestern University, from which he was graduated in the year 1896. He was appointed intern in Mercy Hospital by reason of passing the requisite examination successfully. In 1877 he commenced practice in Princeton, where he soon established a good, lucrative business. Dr. Palmer was well up in his profession, keeping abreast of its literature, progress, and new methods of treatment; was a man of genial nature, approaching the bedside with a pleasant smile, and may be, if a proper subject, a little pleasantry.

I met him frequently in counsel, and was associated with him for several years on the local pension board of this county. I knew him when a boy, being

the family physician in his father's family. He had strong elements of success about him to gain him patients and make them stick, when once he was professionally employed by people.

I would advise that the Bureau County Medical Society in session adopt suitable resolutions expressing its high esteem for our deceased member, Dr. C. A. Palmer, extending its sympathy to bereaved wife, family and friends.

Dr. Owens moved that the report of the Committee on Necrology be adopted and that the president appoint a committee to prepare resolutions, the same to be engrossed and presented to the family. Motion was carried.

The acting president appointed the following committee: Dr. W. M. Kaull, Dr. B. F. Landis, Dr. M. H. Blackbrun and Dr. A. E. Owens.

In speaking of Dr. Palmer, Dr. Owens stated that he had been the first president of the Medical Society, elected sixteen years ago, and that there had scarcely been a meeting which he had not attended and had always taken an active interest in the discussions. Dr. Palmer had been mayor twice. Dr. Owens said that he had been closely identified with Dr. Palmer for twenty-five years. He showed great kindness to young men in the community and was a good business man, one of the best secretaries of the Board of Agriculture that it ever had. He took great interest in the welfare of the city and took particular interest in the sewerage system, and one of the distressing things on his mind during the last months of his life was in regard to the menace to the community of the defective sewerage and the use of cesspools and deep wells in the same vicinity. Almost the last conversation of any length with any one was on this subject.

The treasurer's report showed total receipts $122.93, and balance on hand November 11 $26.69. The report was approved as read.

The afternoon session was called with Dr. Griswold in the chair. A letter was read announcing a lecture bureau; the same was referred to the Committee on Programs. Dr. Trumbauer then read a paper on "Tetanus," which was followed by a paper on "Cancer of the Lip," by Dr. Cook of Mendota, a paper on "Pellagra," by Dr. J. H. Bacon of Peoria, and "The Early Diagnosis of Pulmonary Tuberculosis," by Dr. Butterfield of Ottawa.

The election of officers for the ensuing year was as follows: President, Dr. C. F. Horner, Tiskilwa; first vice-president, Dr. W. C. Griswold, Princeton; second vice-president, Dr. J. F. Lewis, Depue.

Adjourned.

OLIVER J. FLINT, Secretary.

TETANUS.

L. D. TRUMBAUER, M.D., WYANDOT, ILL.

The mortality of traumatic cases is not less than 80 per cent. In others under 50 per cent. The germ of tetanus does not enter the circulating blood, and hence is not found in the various organs of the body, neither do they grow upon superficial wounds of the body because of their anaerobic nature. The bacillus produces a toxalbumin of frightful potency, an idea of which may be gained by comparison with strychnia, which is poisonous in doses of 0.30 milligram, while the toxalbumin of tetanus, requires only 0.23 milligram. Every symptomatic feature may be produced by this toxalbumin without the presence of the bacilli.

Predisposing causes. Any wound or breach of surface may develop the disease, but in a great majority of cases it may follow a severe contusive wound into which some foreign substance containing garden soil, street sweepings, manure or putrefying fluids, has been forced.

Report of a case: Mr. S., aged 45 years, a farmer, sustained, on the evening of Nov. 7, 1903, a compound fracture involving the third toe. Portions of wool, gravel, leather, and a variety of other substances were removed, and the wound was cleansed with a 25 per cent. solution of phenol in water and the parts placed as closely in apposition as possible. In seven days a fairly well developed trismus was seen associated with extreme backache, vague pains in the legs and excruciating pain in the primary wound. This was at once reopened freely and again swabbed out with phenol, a drainage introduced and the family made acquainted with the facts of the case. Counsel was granted at once. Bacilli treatment was

at once begun, and at intervals of three to six hours a 5 per cent. aqueous solution of phenol was hypodermically injected in various parts of the body throughout the course of the disease. Antitoxin was injected subcutaneously twice to four times daily, 10 c.c. being used at an injection. The nervous system all through the disease responded quite pronouncedly to the anitoxin. Muscular contractions or rather exacerbations of the tonic spasm were quite frequent, and at these times great pain was complained of in the abdomen. Opisthotonus now supervened, great restlessness and excruciating pain accompanied it, necessitating the use of alcohol baths with massage and the hypodermic use of morphin and atropin, combined with 30 grains chloral hydrate at intervals, governed by the exigencies of the case. The opisthotonus finally yielded after a few brief moments, when the extreme exhaustion, accompanied by profuse perspiration, would appear, when after a variable time the patient would succumb to a short half hour of restless slumber, only to be again awakened by the extremely painful muscular contractions and would then again go through the same cycle, when hot applications, massage and the judicious use of sedatives were again invited to the field. Voiding of the urine was always extremely difficult and at times impossible owing to the very tonicity of the spasm, when the catheter was inserted and a variable amount of urine obtained at different times.

The pulse and respiration now became quite rapid and irregular, ushering in a right sided pneumonia, with all its usual coincident features. As this paper does not deal with pneumonia, the individual symptoms of this complication will not be dealt with. Suffice it to say that this complication ended in complete recovery, while the tetanus itself still seemed to be at its maximum intensity. Thoracic oppression, dyspnea and at times decided cyanosis occurred, while all the reflexes were decidedly exaggerated and the sensorium was normal. Throughout the attack the febrile movement, barring the influence of the pneumonic process, was very moderate, ranging from 99.2 to 102 F. Finally there was a gradual diminution in the intensity of the spasm, the ever present muscular rigidity gradually became less marked, permitting greater ease in breathing, less cyanosis and finally voluntary urination was established.

Some not uninteresting features now made themselves apparent. Coincident with the use of antitoxin, a well pronounced erythema and urticaria with desquamation was observed, the latter continuing about ten days after the use of the antitoxin was abandoned. Complaint on the part of the patient invited the attention to the teeth, and both the lower first molars were found loose and cracked from above downward through the center, showing the extensive muscular force brought to bear in trismus. In support of this tooth story the report of Anders and Morgan is cited. In their collection of 1,201 cases, one case of trismus was found so great that the teeth were crushed down to their roots. In another fracture of the spinous processes of the vertebrae resulted from these severe convulsions.

Prognosis: Late appearing cases following an injury give the most favorable prognosis. The prophylaxis is the great consideratum. Any breach of the surface or solution of continuity, whether a puncture or a contusion, should be cleansed with phenol from 25 to 50 per cent. solution. At the first symptom of tetanus, serum should be injected and its action maintained by discriminate repetition. Other therapeutic measures and other methods for the control of the various nervous and muscular features characteristic of the disease should be adopted. Prominent among these are morphia, chloral hydrate, chloroform and dionin.

CANCER OF THE LIP.

E. P. Cook, M.D., Mendota, Ill.

1. Etiology.—No evidence of hereditary predisposition (Stokes). Occupation of no influence (Rowntree). Wound or abrasion may be starting point of disease (Fricke). Smoking, especially a clay pipe, is important factor. Pipe with short stem gets very hot, dangerous to hold in mouth. Cigars and cigarettes less dangerous to one spot. Usually thought that male liability due to smoking, but

same sexual liability noted in countries where women smoke. Of Warrens' four female cases, three were smokers. History of smoking in only 1 to 80 female cases (Rowntree). Sanitary condition of teeth and mouth a factor. Lower classes chiefly (Stokes) well-to-do classes escape because they do not smoke clay pipe and keep teeth in better condition.

Male Sex: Twenty in men to 1 in women (König); 4 cases women in 73 (Warren); 90 cases women in 1,264 (Fricke); 233 cases men in 241 = ratio 29 to 1 (Rowntree).

Age: Over 50 years (50 years in Middlesex Hospital); over 50 years (Stoker in 350 cases). Males average 56.4 years (29 to 81 years) (Rowntree). Females average 50 years.

2. *Frequency.*—2.72 per cent. of all cancer cases (Rowntree); 1 case in 50 males, 6.8 per cent. (Rowntree); 1 case in 714 females, 0.14 per cent. (Rowntree).

3. *Pathologic Anatomy.*—Carcinoma of lip arises at juncture of the mucous membrane and skin, but may begin at some distance from margin in either skin or mucous membrane. Origin from mucocutaneous junction, 68 per cent.; origin from red line, 24 per cent.; origin from buccal mucous membrane, 6 per cent.

Location: Lower lip, 34 times to upper (Rowntree); upper lip, 63 in 1,193 cases (Fricke); right and left sides equally (upper lip 2 in 8 female cases); six times more common at side than in center of lip. "Cancer usually begins as indurated area which soon ulcerates, but induration may be preceded by a crack or fissure or eczemous condition of the margin of lip." (Senn.)

4. *Metastases.*—Lymph nodes involved in the following order: Submental, submaxillary, cervical. Glandular infection late in upper lip cancer, then first noted in submaxillary glands. Lymph nodes noted clinically usually in 46 per cent. Gussenbauer long ago noted gland involved in 29 to 32 cases. Lymph nodes involved often present when primary lesion is not greater than hazel nut. In one case metastases was in gland when sore on lip had lasted only six weeks (Fricke). Diseased nodes cannot be always palpated. Palpable in most cases, especially when examination is made with counterpressure in mouth in right places (Dowd). Microscopic examination necessary to decide if fat or glands contain areas of cancer. Submaxillary glands may enlarge from septic absorption from ulcer before carcinoma metastases has occurred. Consider this possibility in deciding if case is inoperable on account of involving the gland.

5. *Prognosis.*—Fifty to 60 per cent. cured by operation. Fricke: Eight per cent. operative mortality; 32 per cent. recurrence of growth or metastases; 60 per cent. permanent cure. Cheyne: Forty per cent. cured. Prognosis depends on gland involved. If jaw is involved, contraindication to operation. If floor of mouth involved, almost hopeless to operate (Stoker). Repeated operation justifiable in recurrence in cheek or lymphatic structure (Stoker).

6. *Technique.*—Wide removal of initial with removal *en bloc* of glands anatomically related to carcinoma area, together with accompanying fatty tissues.

Avoid pressure on afflicted region during operative manipulations on account of danger of squeezing cancer cells out into neighboring structures (Seidel).

Preliminary cauterization with carbolic acid of ulcerated surface must not come in contact with healthy tissue.

Incision: V-shaped incision suitable if growth involves less than one-half of lip. If more than one-half lip, remove entire lip (Teska). Vertical cut from chin to thyroid cartilage and cross cut on each side along lower margin of body of inferior maxilla (Cheatle). Wide rectangular incision (Grant).

Fricke: Goes two-fifths inch wide of infected tissue. Da Costa: Goes one-half inch wide of obvious disease; deformity preferred to recurrence. Ligation of duct of submaxillary saliva glands (Wharton) not necessary. Ligation of facial vessels may cause temporary edema of face. Operation of lip alone under cocain anesthesia.

Suturing Lip Wound: Silkworm-gut sutures passing through mucous membrane down but not through cutaneous surface and tied within the mouth. Approximate skin edge with fine silkworm-gut suture or horse hair. Old method of hare-lip pins obsolete.

Drainage: Perforated drainage of lower lip for 24 to 36 hours. Adhesive strapping to relieve tension on lip wound. Bilateral or unilateral removal of glands.

Cutting through skin, superficial fascia, platysma myoides and deep fascia exposes mylohyoid muscle. Pull mylohyoid muscle well forward, exposing submaxillary salivary glands. Loosen or draw down gland to expose upper anterior surface and remove nodes which regularly lie above it. If glands infect and adhere to salivary gland, remove it, but it is seldom infected. Retract posterior part under jaw and inspect thoroughly under margin of jaw as far back as parotid gland. Often two or three nodes back of the submaxillary gland which should be removed. Retract anterior part of wound and dissect forward to submental nodes usually two or three submental nodes lying one-half to three-quarters of an inch below symphysis menti between anterior bellies of two digastric muscles. If nodes beneath jaw are infected examine deep chain of lymphatics which accompany interior jugular vein. Can reach upper part of this chain through incision, but if necessary to remove nodes from lower part of chain make incision along course of carotid (Dowd).

Only structure to preserve hypoglossal nerve lies on hypoglossal muscle covered by mylohyoid in front.

X-ray treatment indicated, if at all, only in cases of superficial type. A question in operative cases. Little or no effect on glandular deposits of squamous carcinoma (J. Hutchinson).

Question of Radical Operation: Although many patients do recover from whom the lymph nodes are not removed, many others die because they are not removed (Dowd).

On account of liability of carcinoma to develop, every ulceration which does not heal soon should be removed.

There have been about 150 cases in the Peoria Hospital for the Insane. These cases have all been among the insane of an average of fifteen years' standing, and an average of about fifty years of age. There must be a prepellagra stage to the disease, and this is what we are looking for to find out what the predisposing conditions are that may be avoided and what are the prepellagrous symptoms so that we may be able to prevent it in those who would otherwise have it.

The treatment and relief of symptoms temporarily. Some believe that blind staggers in horses is identical with pellagra in man, and if that is the case the serum of those horses that recover might be curative. This is a line that needs to be worked out.

That mouldy corn may be the guilty cause means much to the corn-bearing states. It does mean that we should be more careful in the handling of so important a food product. The country and state government should have a commission appointed to work out a safe method of caring for corn while it is being husked and stored. Until this is done our corn will be under a ban, for who can tell what is disease producing. This is one of my especial points. The other is that all should be on the lookout for this disease, for it is probably to be found in every almshouse and insane asylum of our state. We are as yet to be educated in regard to its prevalence, cause, and cure.

THE EARLY DIAGNOSIS OF PULMONARY TUBERCULOSIS.

E. H. Butterfield, M.D., Ottawa, Ill.

Dr. Butterfield, in his paper on the early diagnosis of pulmonary tuberculosis, quoted Gehardt as expressing himself: "I know cases in which bacilli were not found for months or only in the sixtieth specimen, but when the diagnosis of tuberculosis was established by examination of the chest."

Eichorst says: "Now and then one certainly finds cases in which no tubercle bacilli are found in the sputum, in spite of the undoubted existence of pulmonary consumption." Turban says: "Clinically the first stadium of tuberculosis of the lung may be demonstrated before bacilli appear in the sputum." In commencing tuberculosis of the lung anatomical changes are of such kind that the tubercle bacilli actually present in the tissues can find no means of exit while the foci are

large enough to be demonstrated by percussion and auscultation. The earliest evidence of the disease may be obtained from physical examination. The tubercle bacilli may lie dormant though viable in an unsusceptible host for an indefinite time, and tuberculosis may develop when certain weakening influences come into the human economy. This may be at the time of the invasion of the bacilli or many years later. Apical tuberculosis may remain quite symptomless during life, even though in an advanced stage. In general, the first evidence is when the foci soften and invade a bronchus, *i. e.*, when the tuberculosis, until then closed, is now open.

Symptoms of early tuberculosis of the lung: disturbance of circulation, condition of the blood and digestive organs, of the nervous system, pallor, fatigue, poor appetite, perhaps nausea, irregularity of the bowels, loss of flesh, brittleness of the nails, dryness of the hair and skin, irritable weakness of the heart, and vasomotor system. The pulse is usually persistently frequent or may be very inconstant, rising from 70 or 80 to 100 or 120 or even more on the slightest mental or bodily excitement. May show slight elevation after principal meals and considerable rise after moderate exercise. Less common is a high morning temperature, but this sometimes approaches the evening one or may exceed it.

Very frequent pain is a marked symptom. Not so much pleuritic pain at the seat of the disease, but all over the lower lobes of the affected side, occurring as a dull boring or stabbing pain and radiating down the arm. The cough may or may not be accompanied by expectoration. Where tuberculosis commences insiduously a cough sometimes precedes expectoration by months or years. The quantity and character of the sputum usually depends on the extent to which the air cells and bronchial tubes are involved.

Hemorrhage may occur without the subsequent presence of tubercle bacilli. Hemoptysis usually appears in the initial state. Many patients are especially liable to attacks of catarrh, inflammation of the whole respiratory tract, laryngitis, bronchitis, pneumonia and pleurisy.

Mixed Infection: Local disease affecting the respiratory tract may smooth the way for tuberculosis. Without the assistance of a mixed infection the disease may be widely disseminated from a small nodule via a bronchus or by the lymph or blood vessel; it may follow hemoptysis.

Physical signs of early tuberculosis of the lung: Inspection often reveals valuable information. Very early the affected apex begins to lag behind the other in inspiration; there may be also a slight retraction or wasting of the muscles over the scapula, this giving a prominence to scapular ridge on the affected side. The supra and subclavicular fossa may be depressed and the clavicle consequently more prominent. Often associated with retraction of the lung. Palpation not of great value.

Percussion: Results of positive value may often be obtained from this method.

Auscultation of the lung is of the greatest aid in determining the earliest manifestation of the disease. Roughened breathing and weak vesicular breathing or a combination of the two may be found. Cog-wheel breathing is an early sign. Râles may be present very early or may be long wanting. They are usually of the fine crackling, crepitating variety, more rarely of the medium size. A localized short whining, only audible after coughing, and only on inspiration. Medium râles in any considerable number usually occur with commencing softening of the apices. The earliest signs occurring in the apices are usually heard in the supra and interscapular fossae. A subclavian murmur can be heard during the inspiration and expiration, and is due to adhesions of the pleura to the sheath of the subclavian artery. Symptoms of laryngeal involvement occur frequently in early cases, and may be manifest in a form of chronic catarrh, while slight swelling of the thyroid gland, dilation of the pupils and albuminuria may be noted.

Differential Diagnosis of Early Cases: Usually suggested by ill looks, loss of weight, tachycardia, blood spitting, etc. This calls for a physical examination, which, if it reveals the slightest deviation from the normal type of breathing at

one apex, if there occurs on inspiration or coughing the slightest crackle or whining, if the percussion note is higher in pitch, less resonant, we can say that there is an infiltration at one apex, and may assume that it is tubercular.

Tuberculin as a Means of Diagnosis: When a patient reacts to tuberculin or during the reaction, a perfectly definite change is made out in the physical signs, the method becomes one of the most satisfactory diagnostic aids we possess. We know that the patient has tuberculosis, where he has it, and sometimes about its extent. Koch's method was to inject 1 mg., 5 mg. and then 10 mg., and if there was no reaction then to repeat the last dose.

CONCLUSIONS.

1. Clinically, the first stage of tuberculosis of the lung may be demonstrated before bacilli appear in the sputum.

2. Predisposition, or where one or several individuals of the same family have fallen victims to consumption, the first signs of ill health ought to prompt the physician to exhaust every means and method of diagnosis in order to arrive at a correct conclusion and steps taken if a positive diagnosis is made to insure the patient prompt and rational treatment.

3. That the latent, closed or masked forms of early lung tuberculosis are not easily demonstrated, and if the clinical findings are not of sufficient proof, diagnostic tuberculin should be administered.

4. Repeated negative examinations of the sputum do not preclude the existence of pulmonary tuberculosis.

CARROLL COUNTY.

The Carroll County Medical Society met Oct. 26, 1909, at Mt. Carroll, in the Carnegie Library. The following officers were elected: Dr. C. W. McPherson, Hazelhurst, president; Dr. J. L. Nathanson, Chadwick, vice-president; Dr. H. S. Metcalf, Mt. Carroll, secretary-treasurer. Dr. G. W. Johnson of Savanna read a biographical sketch of Dr. A. D. Hunter, who died Aug. 18, 1909. Appreciative resolutions on the death of Dr. Hunter were adopted by the society. The following program was given: 1. "Eclampsia," Dr. E. L. Hendricks. 2. "Pellagra," Dr. W. E. Clay. 3. "Condiment," Dr. N. Rinedollar. 4. "Paper," by Dr. J. B. Schreiter. 5. "Fee Bills," Dr. J. W. Powers. 6. "Report of an Interesting Case," Dr. G. W. Johnson. The papers and discussions were stimulating and the meeting was a success.

H. S. METCALF, Secretary.

CHAMPAIGN COUNTY.

TREATMENT OF TYPHOID FEVER.*

DARWIN KIRBY, M.D., CHAMPAIGN, ILL.

This is by far too large a subject to be treated fully in the time allotted, so I will simply try to emphasize a few of the things which lately have been receiving a good deal of attention.

Prophylactic treatment has accomplished more in this disease than in any other, with the exception perhaps of small-pox. Both state and town by their health boards have been educating the people, looking after drainage and water supply, inspecting milk and food, fighting the breeding places of flies, and establishing laboratories. Individual prophylaxis is at present confined mainly to the sick room, and concerning this many of you, no doubt, know better than I. Only one thing cannot be reiterated too often, and that is extreme carefulness on the part of the family, physician, and nurse.

There is one field in which little advance has been made, although not new, that is, prophylactic inoculation. We hear many good reports as in the Boer war, and then again many conflicting ones. Schoemaker, who has perhaps done as

* Read before the Champaign County Medical Society.

much along this line as any one in our country, finds that there are greater bactericidal and bacteriolytic properties in the serum of an inoculated person than in normal serum. However, the report is not very enthusiastic. It may do for large bodies of men who are going into a strange country where the disease is rife, but not in ordinary practice.

There is, however, one important field of prophylaxis which has been sadly overlooked in this country, and that is typhoid carriers. By this I do not refer to flies, birds, etc., but to people who have had the disease and are apparently well. In Germany it has been estimated that at least five per cent. of typhoid patients become carriers, and it is doubtless safe to assume the same here. So if possible the feces and urine of every typhoid patient should be examined before he is discharged. The gall bladder and intestines are most often the seat of the infection. In Sweden something like twenty cases were traced to one person, and that person, strange to say, denied all knowledge of having had the disease. I might add that it took the conscientious doctor over a year to trace the fact.

Do you ask what is to be done? Serum therapy has proven a failure, and we would hardly advise removing the gall bladder, nor is isolation feasible. It seems that the best way is to try and change the flora of the intestinal tract, and here the teachings of Metchnikoff may be of value. Another thing is to warn the patient and have him report to, or be under the supervision of a board of health until free from the disease.

Under the active treatment we will first consider serum therapy. This has proven rather disappointing. Many often ask, "Why does it work as in diphtheria?" The bacteriologists tell us that the typhoid bacillus does not produce a toxin which is dissolved in the surrounding media, but one which is retained within the organism itself, an endotoxin. This is only liberated at the death of the typhoid bacillus, which may account for the conclusion arrived at by Prof. Hoffman, that while there are agglutinins and bacteriolytic and bactericidal properties in the serum, there is not sufficient anti-toxin to overcome the toxin which is set free by the death of the bacteria.

Hygienic treatment is so well understood that it is not necessary to dwell upon it. Absolute physical and psychical rest must be maintained; ambulatory patients put to bed; plenty of fresh air and sunshine, ice bag for headache, etc. There is no danger of fever patients catching cold. Cleansing baths, and above all, keep the eyes open for bed sores; enemas every other morning if the bowels are not moving well, or a little epsom salts may be given.

We all know what good hydrotherapy does, whether it be by baths, sponging, or packs. I have often seen the hot pack have a good influence where the patient did not respond to the cold sponging and ice ironing, but remained restless and with a high temperature. Fifty ounces of water are to be given during the twenty-four hours at stated intervals, whether the patient calls for it or not.

Medicine plays but a very small rôle with most physicians except as symptomatic for such conditions as headache, vomiting, constipation, etc., and we all have our favorite remedies for these conditions. Some men still use intestinal antiseptics, but not to destroy the bacilli, because we know now that the disease is essentially a bacteriemia, but to keep down putrefaction and fermentation and thus prevent tympanites. If proper diet is used we need have little fear on this score. Urotropin has been recommended on very high authority to keep the urine free from bacteria and to prevent their lodgment in the gall bladder. Doses up to sixty and seventy grains per day have been used, but this does not appeal to me as rational. A good many advise calomel in order to clean out the intestinal tract well if the patient is seen during the first week.

Complications are to be treated as they arise. Perforation; the treatment here consists of two things, early diagnosis and a surgeon. Hemorrhage; absolute quiet, and ice bag or coils, morphin. Calcium lactate up to seventy-five grains in twenty-four hours may be given by hypodermoclysis. We must also be ready to defeat tympanites, sudden dilatation of heart and bed sores.

Dietetics seem to me to be the most important of all. Very few works give us any aid concerning the metabolism of typhoid fever. It was my good fortune,

however, to hear Schaffer at the meeting of the American Medical Association at Chicago in 1908. He says that during the course of typhoid fever from ten to sixty pounds are lost. It is due to this fact that Ewing thinks many of the phenomena of severe cases arise; due to the auto-intoxication resulting from the burning of thirty pounds of body tissue in three weeks, and not directly to the toxic substances of the typhoid bacilli. This has been proven by urinary examination, which shows abnormal substances such as are found in the toxemia of pregnancy and in acute yellow atrophy of the liver. This loss also is harmful during convalescence. If the patient is under-nourished, he absorbs enough caloric value from his own body to equal the energy expended. There is also more energy expended than normal, due to the increased heat production. The increase according to Kechl is twenty to thirty per cent. Adding this to the normal, which is thirty-three calories per kilogram, or sixteen calories per pound, we find that it makes twenty-eight hundred calories for a man weighing one hundred and fifty pounds. This is the minimum amount of energy expended by a typhoid patient in twenty-four hours.

There are few typhoid patients who receive enough nourishment, so they use up varying amounts of their own tissues. Besides insufficient feeding there are the pyrexia and action of bacterial toxins which cause protein loss. Schaffer advises larger amounts of carbohydrates than both proteins and fats combined. He reasons that there is less intestinal disturbance and rise of heat, and that it throws less work upon the intestines and kidneys. Some may say that the typhoid digestive apparatus is not strong enough; of course it is not equal to that of a healthy man, but Von Hoesslin, Leyden, and others have shown that there is but little impairment if food is given in the proper form. Schaffer obtains most of his carbohydrates by using sugar of milk. The method which I have used differs from the above in quality, as I give more proteid though I arrive at the same caloric value.

I am indebted to Dr. Joseph Miller of Chicago for most of my instruction along this line while at the Cook County Hospital. During the year and a half there I had the opportunity of seeing many cases treated both ways; that is on the milk diet alone, and also by the feeding method, and it was the general concensus of opinion that there was a shorter duration of both acute illness and convalescence when some such method as I shall outline was followed.

The daily diet consists of:

	Calories.
Cream—one quart	1,540
Eggs—four to six	420
Bacon from which lean has been removed—two ounces	540
Cereal—one and one-half ounces	100
Sugar—five ounces	600
Total amount of calories	3,200

Besides the above, or instead of it, some of the following may be allowed: jellies, custards, prune juice, apple sauce, gelatin, peas, spinach, baked potato mashed well, small amounts of thin slices of toast, cream of tomatoes, asparagus tips, tapioca, corn flakes, or some other dry cereal. The cream when given as a drink may be diluted with water, or what is better, seltzer water.

A routine something like this is followed: Breakfast: corn flakes or similar cereal about an ounce with cream and sugar, milk sugar preferred, soft cooked egg, and a little toast. Ten o'clock a. m.: eggnog made with cream, water, sugar, and a little flavoring; no whisky or brandy unless patient is very weak, or heart action feeble, when half to one ounce may be added. Noon: soft cooked egg, bacon freed from lean, one to two ounces, custard and fruit juice. Two o'clock p. m.: eggnog. Four o'clock p. m.: soft egg, gelatin, apple sauce, cream and sugar. Six o'clock p. m.: eggnog or egg beaten with pinch of salt or soft cooked, small piece of bread and cream. The above may be altered to suit the views of the physician, less proteid may be given and more sugar and milk.

The main thing, it seems to me, is to conserve the strength and bodily fitness of the patient; thus raising his immunity so that he may the better combat the various dangers which always surround a patient suffering with an acute infectious disease. The great fear, of course, is perforation and hemorrhage. The diet which I have recommended will be fluid in consistency when it reaches that part of the alimentary tract where most of our pathology lies. Another thing, the patient is much easier to handle. In a majority of cases there is less apathy, less tympanites, and a fair appetite; as a rule little forcing being necessary to get him to take the food.

And then during the convalescence instead of having a patient hollow-eyed, anemic, weak, with flabby muscles, and trying all expedients possible to obtain more food, as any half-starved person would, you have one fairly contented with his lot, except that he wants to get up too soon, perhaps; but otherwise taking his food at stated intervals and contented withal.

A few may say the digestive apparatus is too weak to stand the strain; that we have gone over before but have perhaps omitted one thing, the appetite juice. You may smile at such a name, yet it plays an important part. It is a well-known physiological fact that the smell or sight, often only the thought of pleasing food, causes a greatly increased flow of gastric juice. You have all experienced such sensations, but suppose you were only to look forward to a cup of milk or beef tea. Would there be much gastric juice to welcome it when it passed the cardiac orifice?

Convalescence as a rule causes us but little worry. I think it best to withhold heavy meats until the temperature has been normal for two weeks; the same length of time should also be applied to letting patient up out of bed.

CHRISTIAN COUNTY.

The Christian County Medical Society met in semi-annual session in the county courtroom, Taylorville, Jan. 20, at 2 p. m., and was called to order by the vice-president, Jesse P. Simpson of Palmer, President J. H. Dickerson being confined to his bed by illness. The principal speaker was Dr. J. L. Wiggins of East St. Louis, who spoke on "Some Difficulties Met in Differentiating Between Surgical and Non-Surgical Cases." The paper was very interesting and highly appreciated by those present.

Dr. D. D. Barr of Taylorville gave a paper on "Eye Defects in School Children vs. Effect on Their Mental Advancement," which was based on 1,680 tests made in the public schools of Pawnee, Morrisonville and Taylorville. The doctor pointed out that in the rooms where the pupils had been advanced through hard examinations he found one in six or seven of the pupils of such a grade; but in the rooms containing those pupils who could not pass the hard examinations he found in one room half of the pupils with bad eyes and in another school as many as three out of four with bad eyes. By bad eyes he meant those whose vision was two-thirds or less. He then asked the question: Does poor scholarship make the bad eyes or do the bad eyes make poor scholarship? Many might think that the Doctor was trying to make out a bad case, but he has the teachers of the various schools to verify his statements and even to add to what he read from his paper.

Drs. Albert Field of Stonington and J. N. Nelms of Taylorville were on the program but unable to attend. Drs. F. W. Bechtold of Pana and Norman Pearson of Taylorville were elected to membership. The following officers were elected for the ensuing year: Dr. Jesse B. Simpson, Palmer, president; Dr. J. H. Miller, Pana, vice-president; Dr. H. M. Wolfe, Taylorville, secretary-treasurer; Dr. G. L. Armstrong, Taylorville, delegate to state convention; alternate, Dr. T. A. Lawler, Taylorville. Censors, Drs. James Simpson, Morrisonville, Carroll and Pearson, Taylorville; member medicolegal committee, Dr. J. N. Nelms, Taylorville; public health and legislation, Dr. J. H. Miller, Pana; committee on resolutions, Drs. Carroll, Barr, G. L. Armstrong and M. M. Hill, Taylorville.

COLES COUNTY.

The Coles County Medical Society met Tuesday, Jan. 11, 1910, at 8 p. m., at the Court House in Charleston. The following officers were elected for the ensuing year: Dr. C. B. Voight, Mattoon, president; Dr. F. E. Bell, Mattoon, vice-president: Dr. J. T. Montgomery, Charleston, censor; Dr. R. H. Craig, Charleston, secretary-treasurer. The following excellent program was carried out: "Surgical Diseases of the Abdomen in Children," Dr. J. T. Montgomery. A discussion followed. "Dermoid Cyst," Dr. R. H. Craig. "President's Address," Dr. Cleaves Bennett. Clinical cases.

R. H. CRAIG, Secretary.

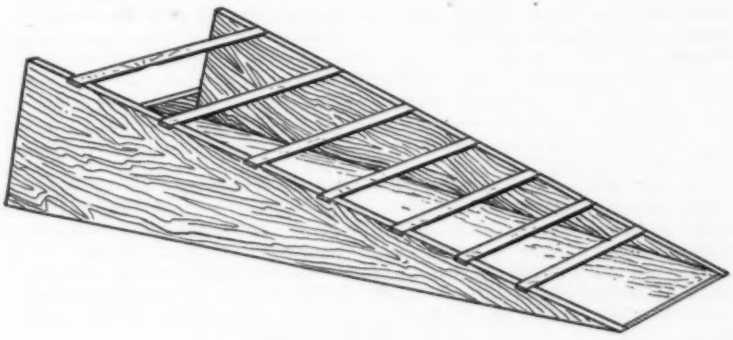
COOK COUNTY.

CHICAGO MEDICAL SOCIETY.

Meeting of Oct. 13, 1909.

DISCUSSION ON SYMPOSIUM ON FRACTURES.

Dr. John E. Owens:—I was very much interested in all the papers that have been read. Dr. Ochsner gives a very excellent exposition of the modern treatment of compound fractures. The subject is so large that one hardly knows where to begin to make even a few remarks. I will say, however, in a general way, that the alcohol dressing which I have used for twenty years in the treatment of com-



pound fractures has given me so much satisfaction that I am near saying it is the best of all the dressings now in vogue. I am speaking now of large wounds. If I remember correctly, Nélaton saved Garabaldi's ankkle joint by an alcohol dressing, and he wrote a very excellent paper on that subject. About twenty-five years ago I began using alcohol dressing on tremendously injured hands. Take, for instance, a case like this: A man's hand is crushed, the tendons bare, the bones broken, comminuted, everything compound. Make a wedge-shaped splint or an inclined plane (Fig. 1.)—a box with two sides like the sketch, and lay the hand, previously dressed, on strips of gauze or rubber sheeting covered with gauze placed across the splint from side to side. The hand must be thoroughly covered with fluffy gauze, both palm and back. This is kept constantly wet with 70 per cent. alcohol, 1 part to 4 parts of water. Several wicks of gauze can be so placed as to conduct the superabundant alcohol to a saucer placed on the floor of the inclined plane. A month ago a man sustained a very severe compound fracture of the bony elements composing the elbow joint, so much so that excision was required. He declined to have an amputation. I really would have amputated the arm if the patient had allowed me to do so. The ulnar nerve was exposed for about two inches and a quarter, bridging across the chasm left by the excision. Subsequently most of the soft muscular parts on the radial side sloughed away. The skin sloughed over about two-thirds of the circumference. I did not attempt to

suture, but packed the cavity with alcohol-gauze. I was interested to know what would become of the nerve. It became softer and softer and frayed away till separation occurred and the wounds have healed. How much use the arm will be to him I do not know. He has a paralysis of both sides of the little finger and one side of the ring finger, but at the same time it is a satisfaction to a man if he has only a clump of an arm left or the clump of a hand and can only move two fingers. That is better than an artificial arm. Grafts from time to time closed the skin wound. We did not put any dressing on the Thiersch-grafts. He wore a splint and a nurse watched the patient to prevent damage to the skin-shavings. In my work wounds are commonly treated in this way. If one desires to preserve a specimen, alcohol will accomplish it. This dressing will prevent infection. A week ago a man came in with a compound dislocation of the elbow. The lower end of the humerus had been forced through the soft parts, causing a large wound on the outer aspect of the joint. The joint proper was open from side to side; sutures previously introduced were all removed, and the cavity filled with fluffy gauze, saturated with alcohol of the strength above named.

Dr. S. C. Plummer:—Our forefathers thoroughly considered the effect of the muscles in causing displacements of the fragments, and the little improvement we have made on the excellent work done before our time has been by means of the *x*-ray. Fracture is frequently complicated, that is, it is not a single line of fracture through the bone, but it consists of a number of fragments, has fissures running off in different directions, has many lines of fracture instead of only one; another thing is how frequently fractures occur without much displacement. Those formerly were unrecognized; for instance, fractures of the carpal and tarsal bones, simple and uncomplicated by other injuries, were considered extremely rare. Now we know fractures of the carpal scaphoid are not uncommon, also fractures occurring to some of the isolated bones of the tarsus. The use of the *x*-ray has made practically unnecessary the routine use of an anesthetic for the purpose of diagnosis. Some of the older surgeons considered an anesthetic necessary to diagnosticate a fracture. Still, it is useful for making an accurate diagnosis, especially if the treatment is going to require an anesthetic. Hoffa warns against the use of an anesthetic for diagnostic purposes. Having a patient asleep and free from pain sometimes makes the surgeon too bold in his manipulation. In impacted fractures of the neck of the femur the use of an anesthetic is contraindicated because a surgeon may manipulate too freely and disturb the impaction. I can think of a case where the bone broke as the result of osteomyelitis which had existed for sixty years; afterward the leg broke practically by its own weight, without any violence of any sort. He then had to have it amputated.

In regard to the treatment of simple fractures by deliberately making them compound, it appears to me it is important to decide as to how long after the injury the operative interference should take place. Especially fractures of the patella in which the open method is often used. Some say operate at once, others say wait. It seems to me proper to wait a while. Tissues immediately after the accident have a lowered vitality, the blood supply is interfered with and the extravasated blood also forms a good pabulum for the propagation of infective germs; consequently to await an interval of perhaps a week is good; and during this interval the use of massage is advisable. This improves the circulation and hastens absorption of the extravasation and puts the tissues in better condition to resist possible infection and to repair more quickly.

Dr. Aimé Paul Heineck:—One of the most valuable subjective symptoms of fracture is pain. Pain is constantly present in all fractures that are not spontaneous or pathologic in nature. This pain is always most marked at the seat of fracture, and is always intensified by pressure and by mobilization of the fragments of the fractured bone. A sudden solution of continuity of bone or cartilage unassociated with pain is highly suggestive of a pathologic fracture. The *x*-ray is a valuable diagnostic aid to resort to.

All compound fractures are not equally significant. A fracture, compound from within, does not have the significance of a compound fracture due to direct

violence. In the latter not only have the soft tissues overlying the seat of fracture been much contused, much lacerated, but the probability of infection is great. Infection determines the course of the case. Take care not to transform a simple into a compound fracture. Tetanus is an unfortunate complication in compound fractures, and to prevent its occurrence make a prophylactic injection of antitetanic serum. This agent is non-toxic, and though a few cases of tetanus have occurred after its prophylactic employment, our confidence in it is unshaken.

Among the fractures of the patella that have been shown this evening, some were treated operatively, some were treatd non-operatively. Clinical observation and a study of the literature of the subject have convinced us that operation is indicated in some cases and contraindicated in others.

The open operative treatment is indicated: 1. In all fresh fractures of the patella in the absence of contraindications. 2. In all compound fractures. 3. In all comminuted fractures. 4. In all cases associated with considerable intra-articular effusion. 5. In all cases associated with marked laceration of the peri-articular tissues (ailerons, reserve extensor apparatus). 6. In all cases in which the interfragmentary space or diastasis has at any time exceeded 3 cm. 7. In such fractures as are very liable to cause serious functional joint impairment. 8. In all fractures of the patella occurring in individuals upon whom at one time or other a leg or thigh amputation has been performed. 9. In all fractures of the patella occurring in individuals having some permanent functional impairment of the opposite knee. 10. In all individuals who, having sustained a partial amputation of the leg, can, for flexion and extension of an artificial limb, derive benefit from the preservation of the integrity of the extensor apparatus of the leg. 11. In all bilateral fractures of the patella. 12. In all refractures in the absence of contraindications. 13. In old fractures of the patella, associated with marked impairment of function, dependent on non-union, long fibrous-union, union of patellar fragment to femoral condyles, or union of fragments in faulty position mechanically interfering with function.

We do not advise the open operation: 1. In fractures of the patella that occur in a diabetic patient. 2. In fractures of the patella occurring in patients having advanced tubercular disease. 3. In fractures of the patella occurring in patients suffering from well developed cardiac, renal, or hepatic disease, or from malignant disease. 4. In closed longitudinal fractures, with no displacement, or with but slight lateral displacement. 5. In subaponeurotic or in incomplete fractures. 6. In which the separation of the patellar fragments is so slight as to be barely detectable. 7. On patients who prefer to pass their lives partly disabled.

Regular Meeting, Nov. 3, 1909.

A regular meeting of the Chicago Medical Society was held on Wednesday, Nov. 3, 1909, at 8:30 p. m., in the Assembly Hall of the Northwestern University Building. The president of the society, Dr. John A. Robison, occupied the chair. Dr. William A. Evans, Chicago, addressed the society on "The Early Diagnosis of Tuberculosis." Dr. Karl von Ruck, Asheville, N. C., presented a paper entitled "On the Specific Treatment of Pulmonary Tuberculosis." Dr. Sherman G. Bonney, Denver, Colo., read a paper entitled "Recent Observations with Reference to Certain Clinical Aspects of the Tuberculosis Movement."

THE EARLY DIAGNOSIS OF TUBERCULOSIS.*

W. A. EVANS, M.D., CHICAGO.

Mr. President:—I want to direct the attention of the local profession to the great necessity for earlier diagnosis of tuberculosis than prevails at the present time. My treatment of the subject will not be along the lines of the technical side, the means of early diagnosis, but will refer to the advantage of early diagnosis, in fact, the necessity of it.

* An address in a symposium on tuberculosis before the Chicago Medical Society, Nov. 3, 1909.

I have here some figures that have been prepared by Drs. Drake and Helm of the Department of Health, which bear on the tuberculosis rate in the city of Chicago, and the reporting of tuberculosis during the life-time of the patient. Some of the figures bear on the question of the promptness with which the cases were reported, and, of course, very remotely on the stage of the disease at which the diagnosis is made. I find in the two-year period between November, 1905, and November, 1907, there were 940 living cases of tuberculosis reported to the Department of Health, and in the period from 1907 to 1909 there were 6,196 cases reported either during the life-time of the patient or shortly after the patient's death had occurred, as I shall presently explain. In the first two-year period there were 7,963 deaths, and in the second two-year period there were 7,695 deaths. It is estimated that Chicago increases in population at the rate of between 60,000 and 65,000 per year, and this would mean that at the end of the four years there were 260,000 more people in the community than there were at the beginning of the four-year period. In 1906, 277 cases were reported and 3,837 deaths. These first figures are from November 1 to November 1, but the figures I am now reading are for the calendar years, with the exception of the last item in 1907 of 919 cases reported and 4,030 deaths. Practically all of the 919 were reported during the last five months of the year. In 1908 2,577 cases were reported and 3,934 deaths; in 1909, 3,362 cases have been reported during the first ten months of the year, and there have been 3,245 deaths. In other words, the number of cases of tuberculosis reported during this year, while the patient was living or soon after death, is in excess of the number of deaths.

We have made three groups of the reports, first, as to whether the patients were reported by physicians as part of their work in connection with private practice; second, whether they were reported by hospitals, and, third, whether reported by the Tuberculosis Institute. I find that during six months of this year, beginning with April, there have been 1,754 cases analyzed with this point in mind. Of that 1,754 the physicians have reported 911, or something more than half; the hospitals have reported 442, and the Tuberculosis Institute has reported 399. The physicians, in their private practice, are caring for something more than 50 per cent. of the tuberculosis. This summary fairly expresses the conditions as they are. Certainly a considerable part of the consumption in the community is being cared for outside of the private practice of physicians, and a very considerable part at some time of each individual case is being cared for by institutions, and outside of the private practice of physicians. We find that these changes occur at both ends of the line; that there are cases that are diagnosed by the Tuberculosis Institute and later are cared for by family physicians, and then again there is a very considerable collection of cases of consumption that are primarily diagnosed by the family physician and that die in one of the hospitals for consumptives. We find illustrations of the movement in each of these directions.

Now here is the analysis of 1,947 deaths occurring during the spring and summer and fall of this year. Of these, 751 were reported as living cases of tuberculosis; 1,196 were not so reported. The percentage reported as living was 38.7. We are greatly interested in the question as to what period of the disease was the report made to the Department of Health. We find of this number 63 were not reported to the Department of Health until after the patient died; of this 63, 37 were reported by physicians and 26 by hospitals. That occurs in this way: A doctor goes to see a patient, and sends in a report by mail to the Department of Health, and before the report reaches us the patient dies. The undertaker comes along for the death certificate, and as soon as he gets it he goes straight to the Department with it. Cases reported one week before death were 134; one to two weeks before death, 67; two to four weeks before death, 94; two to four months, 142; four to six months, 147. We find these proportions change as we go down the list. The cases of tuberculosis that are not reported until within four to six months of the death of the patient, one would say, do not constitute a fair criterion of the state of the diagnosis in this community, and one might say that there is no particular gain from having those cases reported at all. There is a

very considerable advantage in having such reports, since it is the deaths of the last six months that is the maximum menace to the community, and therefore it is exceedingly vital that the Health Department should have some knowledge of the cases during that time.

I presume that it is a matter of common information that tuberculosis is not being diagnosed as early as it should be, and it seems to me that right here in early diagnosis lies the crux of the entire consumption situation, whether we view it from the standpoint of the community, and the protection of the community, or from the standpoint of the family physician, or from the standpoint of the hope of cure of the case. I know of no more unsatisfactory medical procedure than caring for hopeless consumption. It is unsatisfactory, because, as a general thing, the patient has gone on until within three or four months of his death. He has exhausted all his means, and that of the contributing members of his family or social organization with which he is connected. He does not make for the reputation of the doctor, and on top of that I know of nothing more trying for the physician than that he is sitting idly by, unable to render any material service for his patient. Therefore, the doctor is interested in making the diagnosis when he can say to the patient: "I am able to cure you here, within the limit of time and within the limit of expense that is within your reach." It doesn't matter very much if a persimmon is twenty feet up in the air, and we have a pole or not, if the pole is only ten feet long. There is seldom a diagnosis made by the ordinary physical procedure that reveals a case of tuberculosis that is curable in less than two years, even accepting as cured those cases of arrested disease, and far more frequently when the diagnosis is made the disease is incurable. To say to the patient, "You can be cured in three years," when that patient cannot possibly sustain himself for longer than one year, is, of course, virtually to say to the patient, "You must exhaust all your resources, and then you must inevitably die."

The doctor is greatly interested in early diagnosis, and the community just as much. There is a period in the history of every case of tuberculosis when it can be cured in three or six months, and there is another period when it cannot be cured at all, or in less than two or three years. There is scarcely a family in the community but that in some way can carry a dependent member for three or six months, but there is scarcely a family in the community that is able to carry a member of that family for three years, and give to that dependent member all of the things that are needed. Therefore, the crux of the situation, from an economic standpoint, is a diagnosis at a time when a cure can be effected by means that are within the reach of the patient, his family or those that are closely bound up with him.

I do not believe that the degree of technical skill required to diagnose these cases of tuberculosis will be reached by the man who comes in contact with it first, for many years to come, and during that interval we shall have people die at the rate of 4,000 a year in this community because of the neglect of diagnosis, a diagnosis which requires so little of technical skill as that which can be applied by people who are not working constantly and all the time in this one special field of medicine, and that method of diagnosis is by the use of tuberculin. I have about exhausted my time, but I believe it is generally accepted now that it is accurate to a degree far surpassing the average degree of accuracy of diagnostic procedures. I believe that even those who contend that there is some danger in its use are willing to admit that that danger has been grossly exaggerated, and that harmful results are few as compared with the hundreds and thousands of people who are dying only by reason of the fact that diagnosis has not been made early enough.

There is a great wave in this country in favor of a qualitative determination of relative values rather than a vague chasing after possibilities, which has constituted the practice of medicine in times past. Let us consider the possibility on the one hand of harmful results, and on the other hand the hundreds of thousands that are annually dying for need of accurate procedure in diagnosis requiring a relatively small amount of skill. The figures I gave are not peculiar to Chicago.

I believe that I am of the same opinion as Dr. Saxe, that so far as the diagnosis of tuberculosis is concerned, that the family physician is furnishing a diagnosis that is quite satisfactory, compared with the average standard of diagnosis. The diagnosis they make is about as accurate as that which comes from men connected with the hospitals and the Tuberculosis Institute itself, but there is a crying need for the use of this accurate diagnostic procedure, which at the same time is relatively safe.

DISCUSSION OF SYMPOSIUM ON TUBERCULOSIS.

Dr. Charles Louis Mix:—Mr. President: I hardly see how it is possible for any one to do justice to the excellent papers that have been read by all three of the gentlemen, in five minutes. There are a number of things which struck me in each of the papers read, but I shall speak of only one or two. I was particularly pleased to hear Dr. Bonney advise us to pay more attention to physical examination, and not so much attention to the laboratory examination. I believe that it is possible, in the majority of cases, with careful physical examination alone, to determine the presence of tuberculosis. The ordinary tuberculin reaction is valuable at times, but only at times, and I do not believe it is at all necessary to use it in every case. Dr. Bonney spoke of some signs which are to be found in the apices of the lungs, speaking of the very slight, almost imperceptible click which one finds at the end of the inspiratory effort. This is absolutely disregarded by a large number of medical men, who do not pay sufficient attention to very little things. There is another sound of a good deal of value, and that is the prolongation of the expiratory murmur, which helps one immensely in the diagnosis. Of course, this is not found in early cases, and if you see your case sufficiently early you may not have this sign, but many people do not come to us until they have had tuberculosis sufficiently long for it to show.

I am also very much interested in the work reported by the von Rucks. I have always been of the opinion that there is some prognostic value in the Widal reaction in typhoid fever, notwithstanding the fact that many bacteriologists tell us that this reaction coming early has no prognostic value. It is very interesting, therefore, to learn that agglutinin, with very small dilutions, has very marked prognostic value. I think, too, that it was very fitting for Dr. Evans and Dr. Bonney to insist on the importance of early diagnosis. There is no use to try to treat these cases when they are half dead, and many of them are half dead when they come to us. If those who are teaching in medical schools will carefully instruct the students to make an early diagnosis, and if the people will come to us early, it will not be very long before we will have a death rate showing a very much greater decrease than it shows at the present time.

Dr. Frederick Tice:—Mr. President and Members: To-night we are particularly favored and fortunate in having with us as our honored guests, recognized authorities, ones preeminently qualified and with an international reputation. We are to congratulate ourselves on our good fortune. It is with considerable timidity that I will attempt a discussion for fear of detracting rather than adding to what has already been said. A few points, however, may be emphasized.

Concerning the great importance of an early diagnosis in tuberculosis all are agreed. In our endeavors to make such a diagnosis, while the condition is yet a closed tuberculosis, repeated examination of the sputum and more recently the detection of the bacilli in the circulating blood as suggested by Rosenberger, are of but little or no value. Too often symptoms and signs are only suggestive or suspicious. Practically all admit the value of the diagnostic use of tuberculin, but there exists a wide difference of opinion as to the method of its employment. We know that harm results from over dosing when employed therapeutically, even in small doses, and it is reasonable to conclude that harm may result in the subcutaneous diagnostic dosage. As the same knowledge may be obtained by the local employment, when one of the skin tests is used, without the least harm, it would appear that a local is to be preferred to the subcutaneous.

The contents of this most admirable and valuable paper of Dr. von Ruck, for most of us, will require subsequent study. For some time past a study of the

work by the Drs. von Ruck has impressed me. Although opposed and at times severely criticised, they have continued and if results are a criterion their labors have been rewarded with success. Much credit is due them. Two points may be emphasized: First, the unquestionable advantage of the use of tuberculin therapeutically, especially the watery extract. Second, the estimation of the agglutinating power of the blood and the blood-alkalinity as a measure of the degree of resistance. The methods and results are particularly encouraging at this time, for with the opsonic index discarded, the usual empirical method of depending on the clinical symptoms must lead to disaster.

Dr. Bonney's excellent paper comes at an opportune time. I would emphasize; first, the quite general but unwise custom of advising patients, as soon as the diagnosis is made, of seeking a Western climate. The majority, particularly the indigent, are far better off at home. Second, I direct the attention of the society to the recent action of the State Board of Examiners of Oklahoma, in refusing to license tuberculous physicians. The public and the profession owe much to many of these poor unfortunates, and this society, as others have done, might do well to enter a protest.

I would personally express, and I believe I voice the sentiment of the entire society, my sincere appreciation of the papers of the evening.

Dr. Clarence W. Leigh:—Mr. Chairman: After listening to the two very interesting and scientific papers I also feel that there is nothing that I can add that would be of interest. I believe it is admitted by every one that the early diagnosis of pulmonary tuberculosis is exceedingly important. One of the principal reasons why we do not make a diagnosis in the early stages is that in many cases we do not see the patients in these stages. I think we see them oftener in the moderately advanced, or even in the advanced stages. The average layman is as pessimistic as ever regarding the curability of the disease, and very often when a diagnosis of incipient pulmonary tuberculosis is made he is exceedingly loth to accept it. The failure to make an early diagnosis in these cases, therefore, I should say is not so remarkable. If it is true that the majority of persons are infected in infancy or childhood, it would seem that in the future our investigations should be along the line of the pathology of the incipient stages of the disease in infancy, and in childhood. It is barely possible that we may be compelled to revise or alter our views in reference to heredity, as it applies to tubercular diseases.

Dr. von Ruck has shown the importance of the immune bodies, and also that the sera of babies exhibits the presence of these immune bodies, and that they are transmitted through the placental circulation, and, what is still more remarkable, that these bodies have been transmitted from the tubercular father to the child, when the mother was apparently free from tuberculosis. I think it was His who demonstrated that there are granular forms of the tubercular bacilli which do not stain with ordinary methods, and which are capable of producing the disease and also that under such conditions lymph glands, in which the presence of the bacilli can not be demonstrated, produce the disease, when injected into guinea-pigs. That hereditary tuberculosis has been proven, is admitted, and it is possible that there are many more cases of this type than we have been led to believe in the past Taking all these factors in consideration it is possible that we are not entirely warranted in concluding that there are so few cases of the hereditary form of the disease and that the conditions we term predisposition tubercular temperaments, etc., are modified forms of the disease.

Dr. Wm. J. Butler:—In regard to the use of tuberculin in suspected tuberculosis for diagnostic purposes, I believe that the recent literature on this subject has not served to enlighten us fully on the exact value and limitations of tuberculin when used diagnostically. There is an impression commonly expressed that a positive reaction to tuberculin in whatever manner employed means that the individual has tuberculosis at the time the test is made. This is absolutely erroneous. A positive skin reaction for tuberculin in infancy means that in all probability the infant has active tuberculosis. In later childhood and adult life it means that the individual has reacted at some time during life or is reacting against tuberculosis, but carries no weight for the decisive differential diagnosis of tuber-

culosis in the individual at that time. The same may be said of the other surface reactions that have been advanced. Wolf-Eisner, recognizing this point, claimed for the conjunctival reaction special value for the diagnosis of active tuberculosis. He is apparently alone in the substantiation of this.

The same may be said of the stick reaction. The general reaction obtained by the subcutaneous use of tuberculin becomes decisive for the diagnosis of tuberculosis, especially when we have evidence of increased activity of the process in the focus of infection.

There is hardly a disease to be mentioned in which a study of the antibodies has been more unsatisfactory than in tuberculosis. A parallelism between the agglutinin contents of the blood and improvement in tuberculous patients has been denied by Jürgens. Bordet first called attention to the complement binding antibody in the blood of animals inoculated with tubercle bacilli. Wassermann and Brucke studied this question in man and believed the complement binding antibody to be found in the blood after tuberculin inoculations only.

I have studied the complement binding antibody of tuberculous cases and find it both in cases that have and those that have not been treated with tuberculin. I have not been able to note any parellelism at all between the complement binding antibody and the opsonic content of the blood for tubercle bacilli.

Dr. J. W. Pettit, Ottawa:—I want to take this occasion to pay a personal tribute to the work of the von Rucks. The reports that have been sent out by the von Rucks up to even the last year or two have been so much better than others, especially with tuberculin, that they were questioned and criticized in this community. I made a trip to Asheville purposely to investigate their work. Of course, I cannot certify as to the statistics, and so forth, but I can as to their earnestness, and their effort to contribute to scientific knowledge, especially along this line. They have been persistent and constant users of tuberculin when it was still in dispute, and I want to say that they have contributed more out of their own personal means for the advancement of science along this line than any men I have ever met.

Dr. W. T. Brown, Ripon, Wis.:—Mr. Chairman: There is one point I would like to bring up with reference to what Dr. Evans had to say about the persimmon being twenty feet high, and the pole ten feet long. We cannot lengthen the pole but we can, by a concerted effort, draw the persimmon down. We all understand the necessity of early diagnosis. There is another feature to be considered. You have made your early diagnosis, but you have a patient that can afford only seven to ten dollars a week. What are you going to do? There is no sanatorium that can accept him at such a price. When you stop to think, the West is filled with Eastern people, who are practically cured, and who never saw the inside of a sanatorium, and it seems to me there is a field where a great deal can be done, where the indigent tuberculous patient can be treated at a nominal expense.

We need practical sanatoria conducted on common sense principles, where the patients will be required to do a part of the work, thereby lessening the expense.

Dr. von Ruck (closing the discussion on his part) said:—The point made in regard to the prognostic significance of the degree of agglutinating power was not intended to apply to that observed on admission of patients, prior to specific treatment, and although some authors have drawn favorable prognostic inferences, even then, the low degree present at such a time is insufficient to assure the presence of a considerable degree of self-immunization. It is also well known that in the early beginning of the disease the agglutination power may not have developed at all or be observed in but a slight degree, while in the advanced and cachectic stages the agglutinins often diminish or disappear. On the other hand, a high degree of agglutinating power is indicative of a correspondingly high degree of specific resistance, and in this sense I consider it of favorable import.

In regard to the relation of the opsonic index to the amboceptor, our purpose was to call attention to the correspondence in their increase and decrease, the curves running parallel in all cases which we have studied. This is, however, not saying that the specific substance on which the serum function depends, is

therefore the same; although the observations on our part suggest this. The phagocyting power of leucocytes for tubercle bacilli is not specific and is observable under the influence of normal serum. It is increased under immunization in the course of which specific amboceptor appears and increases, and both effects may be produced by the same cause, or may depend on independent substances formed under the specific stimulation.

The question of early diagnosis has not been considered in the paper presented for your consideration. I may, however, say that the recent method of applying the tuberculin test I consider of decided advantage. With the old subcutaneous method severe reactions which are not only alarming and discouraging to the patients, but have at times been attended with serious harm, have been noted by competent and experienced observers and on that account the subcutaneous tuberculin test has been justly limited in its application.

On the other hand, the cutaneous test is in its very nature perfectly safe, and the conjunctival test appears to be so, if we use the precaution of limiting its application to the normal conjunctiva and avoid the instillation of solutions stronger than the 1 per cent. and of excessive amounts.

In cases studied in the Winyah Sanitarium we have been able to confirm several observations made by others that under the conjunctival application of tuberculin systemic effects with or without focal reactions in the tuberculous lung may occur. We have seen slighter temperature rises and with more or less general malaise in a few cases only; much more frequently and without exception in all of twenty consecutive selected cases (which were favorable for such observations) we have been able to demonstrate focal reactions by treatment, and in some instances hourly examinations of the chest. These reactions were, however, slight and transient and would have easily escaped our notice had not our attention been directed to them by several similar observations reported by other observers. By too liberal instillation of the tuberculin solution, enough absorption can occur to cause even general reactions, and while the focal reactions which we have observed have passed off quickly and in so short a time as an hour, it is probable that they can both be avoided by reducing the quantity of the solution instilled, for which a specially devised dropper or measure may be of advantage.

The conjunctival method of application will undoubtedly be further perfected in the sense of accuracy of the amount instilled; but with the exclusion of scrofulous eye affections, and the limitation of the test to normal conjunctivæ it would seem that even now the general practitioner will meet no material difficulty while the test will afford a most important addition to his diagnostic resources, for cases of early tuberculosis in which there is as yet no expectoration, or the latter does not as yet contain the specific bacillus.

Concerning our clinical results, I may state that many other observers have attained similar percentages of improvements and apparent recoveries and permanencies to those we have reported, and they are unanimous in attesting to the absolute safety and absence of disagreeable effects of the preparation which we have employed. With its demonstrated efficiency we have naturally preferred it to others, which are not free from the objections of causing severe and at times dangerous reactions, with subsequent local and may be uncontrollable inflammations following.

We believe that we have demonstrated by our own and by the results of numerous independent observers not only the value of specific treatment in properly selected cases, but also that with a safe and efficient preparation the general practitioner can deal successfully with the disease to a degree far exceeding that which the most ideal climatic and hygienic methods have heretofore accomplished even in the hands of specialists. By the additional advantages of an early specific diagnosis with the aid of the conjunctival and cutaneous tests, specific treatment can be resorted to at an early period, when the patient is in the most favorable condition for his recovery, and its benefits can be shared by that large class who cannot afford the sacrifices incident to climatic, sanatorium and other methods of treatment which, valuable and important as they are, espe-

cially when the disease is well established and more or less advanced, are not within reach but of a small minority.

Dr. Bonney, Denver, Colo. (closing the discussion), said:—While there are a number of things I would like to say, I will make my remarks very brief. During the last year or two I have noticed a tendency on the part of some experts to exaggerate the importance of signs that are more or less inconstant and rather difficult of recognition. I have also noted a disposition in some quarters to disparage the diagnostic ability of those who depended on auscultation for the recognition of early phthisis. Inasmuch as more than one-quarter of the new patients whom I have seen this year have come to Colorado to make a fight against an imaginary foe, many with erroneous or exaggerated ideas as to the degree of infection, some of them without financial means, or acquaintance, I thought it fitting to call attention to the importance of not overlooking the old-fashioned methods of diagnosis. I believe in the importance of auscultation in the detection of early phthisis. For this reason I have thought it wise to say what I did with reference to these slight modifications of the respiratory sounds. Residing in a health resort, and seeing this year 313 new patients, many of them bringing charts in various colored inks, depicting a multiplicity of detail with reference to physical signs which I could not find, and yet frequently overlooking semi-dry râles, I believe it important to emphasize these matters. I do not think we ought to adopt any specific treatment as a routine measure applicable to all cases. I find that specific treatment is a two-edged sword that is capable of doing a vast amount of good in properly selected cases, and capable of doing an infinite amount of harm in other cases, and I do not feel that we know enough about it as yet to differentiate accurately. I have been a very bitter opponent of tuberculin therapy until three years ago, and then felt that the evidence was sufficient to justify its trial. In beginning this treatment I decided to select a class of patients to whom it might be particularly applicable. Therefore I selected patients who had been in Colorado from one to ten years, and who were more or less at a standstill, in order to eliminate any confusion resulting from the possible influence of climatic change. For non-febrile patients whose condition was more or less stationery I satisfied myself that tuberculin was frequently a most valuable agent. I then tried it in other cases, those in advanced stages, febrile cases, incipient cases and those with mixed infection, and published my results. While the evidence is sufficient to convince me that under proper precautions it represents one of the very important aids to treatment, I have seen enough to satisfy me that it is not a proper agent to be put into the hands of general practitioners for routine administration.

I want to say one word about the tuberculin tests. Inasmuch as it is generally accepted that the ophthalmic test gives response in cases of recent infection, and the cutaneous test in old long standing cases, it is easy to see how little importance we can attach to the cutaneous method in adults. The primary consideration is not to determine whether a man had tuberculosis years ago, but rather if the loss of weight, the cough of two or three weeks' duration and general malaise are dependent on a recent influenza or due to incipient phthisis. If the cutaneous test is not of practical value in these cases, then we should have recourse to the ophthalmic method amidst doubtful conditions.

There seems to be at present a movement in repudiation of the utility of the ophthalmic test, and I think it is pretty conclusively established that unfortunate results have followed its indiscriminate employment, but in obscure cases, when I have wished to determine as to the existence of active tuberculous involvement I have made use of this method and I have never thus far seen the slightest injury result. I don't think we should go to the extreme of condemning the eye test entirely, for in the hands of competent physicians it is still worthy of a trial. I thank you for the opportunity of being present to-night. [Applause.]

Regular Meeting, Nov. 10, 1909.

A regular meeting of the Chicago Medical Society was held Wednesday, November 10, 1909, at 8:30 p. m., with the president, John A. Robison, in the chair. The subject of the meeting was a symposium on "Pure Foods." The following papers

were read: "The New Pure Food Catsup; or When Is a Chemical Not a Chemical?" by John A. Wesener. "The Preservation of Meats by Cold Storage," by Prof. H. S. Grindley, University of Illinois. "Foods from Corn," by Thomas B. Wagner, Chicago, "The Enactment of Food Laws; Their Enforcement and Effect," Thomas Lannen, Esq., Chicago. "Bleached Flour," George L. Teller. Demonstration: "Various Tests of Milk, Human and Bovine," Adolph Gehrmann. The symposium was discussed by Prof. C. S. N. Hallberg, Prof. J. H. Long, Dr. W. S. Baer, and the discussion was closed by Dr. Wesener and Mr. Lannen.

DISCUSSION OF THE SYMPOSIUM ON PURE FOODS.

Prof. C. S. N. Hallberg:—I was certainly glad to hear this criticism of our methods of legislation in this country, but the honorable member of the bar seems to forget that most of the states had food laws before the Federal Act and we would probably be in a worse position without the Federal Act than we are now. The Purpose of the Federal Act is to set a standard that the states can have something to go by. However, I rise more particularly to speak with reference to the subject of food catsup, as it is called. Dr. Wesener starts out from an entirely wrong premise. We must distinguish between food and condiments. What would apply to a food would not apply to a condiment. Food is taken in a large quantity while a condiment is not. Catsup, as its name indicates, is to "catch up," to give an appetite, to affect the gustatory nerves, and psychologic effect, etc., is what is desired when you use catsup. I do not think it is the intention of any one to spread catsup on bread and eat it in that way. Probably catsup would not be palatable if it had very much of the spices and vinegars in it when it is eaten that way. I hold that catsup is a condiment and should be used in moderate quantities, and for that reason it should be aromatic. It should be spicy. But the principal fault I find with the presentation of Dr. Wesener is in placing in the same category benzoic acid with the natural products and derivatives of spices. He speaks of benzoic acid being found naturally extensively in food substances. That is true, but it is not the benzoic acid made from urine or latterly made from toluene. The benzoic acid and benzoate, of which we use at least 99 per cent., comes from an agent made from toluene. It is a coal-tar product. We have got enough coal-tar products masquerading under different names, as, for instance, acetanilid, etc., without taking them daily with our food. I am opposed to the gas-house industry in our foods, for we have enough of it in medicine.

The statement made by Dr. Wesener with reference to the dosage is wrong. The average medicinal doses of these substances are given in the pharmacopeia, and if it is a question of dosage, let me call your attention, for example, to creosote. Creosote is composed of substances known as phenols, creosol and guaiacol, but the phenol of creosote is entirely different from the phenol of the gas-house. Creosote can be taken in doses of from 1 c.c. to 5 c.c. Ten or 15 grains or one cubic centimeter of phenol, carbolic acid, the coal-tar phenol would almost kill. There is no similarity except in a general way between the artificial products and the natural products. The spices, the derivatives and the active principles of cloves, cinnamon and similar agents can be taken in large doses, while the same amounts taken of artificial substances as represented by benzoic acid, salicylic acid, etc., are entirely out of the question and are really poisonous. I am surprised that Dr. Wesener should endeavor to show that acetic acid was poisonous. He is not familiar with it or he would not say that acetic acid, used even in large quantities, is poisonous, and that it is still labeled with the skull and crossbones. It is preposterous to say that vinegar, when taken in moderate quantities, is poisonous.

This is not an age of grandmothers. This is an age of pasteurization. The modern methods of pasteurization are known to the housewife, to Madam Qui Vive, Marion Harland, and other teachers of the public. By these methods catsup can be made without any additional preservatives and kept reasonably just as well as it can be made by loading it with any of these preservatives. A condiment naturally is in a different class with the foods. That is one of the points

we must remember. If Professor Wesener prefers a catsup which is practically canned or stewed tomatoes which simply has a little flavor in it, it is necessary that we add some artificial preservative to it, but for catsup and all these other condiments the proper and natural preservatives are the spices. I would emphasize the importance of making a distinction between artificial preservatives and natural ones, and in so doing we must not overlook the fact that about a year ago there was a case before the coroner's jury which went to the grand jury of an infant who had been given two drops of carbolic acid by mistake. Creosote had been prescribed and the infant died after the second dose. It was not established that the infant died because it was given creosote, but the presumption was to that effect after it had been given carbolic acid.

As I said at the beginning of my remarks, we have had enough of these gas-house products from every point of view. Recently a woman died from the effects of a shampoo agent made from one of these gas-house products.

Not long ago a man died because his abraded finger came in contact with a shoe polish which was loaded with a gas-house product. We feel that it is high time to stop German importations. Even the Germans themselves, if I understand the situation correctly, recently went back on their agreement that they were going to let down the bars on American foods, but as soon as they heard this decision which was supported by the Remsen Committee they decided that they would again put up the bars against the importation of American foods. The Germans make these products and they probably understand more about them than we do.

Dr. John A. Wesener:—You are a member of the Committee on Revision of the Pharmacopeia, are you not?

Professor Hallberg:—Yes, sir.

Dr. Wesener:—Your Pharmacopeia states that methyl salicylate, oil of betula, and oil of wintergreen are one and the same substance.

Professor Hallberg:—I think the Pharmacopeia states that for flavoring purposes, oil of gaultheria, oil of betula, and methyl salicylate are identical products, when the quantity used is small and artificially made use of, but not for medicinal purposes.

Dr. Wesener:—It is stated that they are used for identical purposes, and I believe the chemical formula is the same. In like manner the Pharmacopeia recognizes that salicylic acid and also vanillin made artificially from coal-tar products are identical with the same substances as they occur naturally in plants.

Now, I dislike to disagree with my oratorical friend from the North Side, and I have listened with a great deal of attention to his reply, and I have heard so many similar discussions along this line of the spread-eagle type, with no science or any investigation back of them, that I have paid very little attention to them. The question of gas-house products has nothing to do with the subject we are discussing to-night, only in so far that if we can make products absolutely pure, even purer from the gas-house products than from other sources, why should we not, in the present age of advancement, take advantage of it? What are we here for? Are we going back to what our mothers and grandmothers used to do? Not at all. Conditions are changing every day. We have got to advance. It is the economic conditions that compel us to advance. If we eat beef steak or eggs there is bound to be more or less fermentation set up in the bowels. With fermentation in the bowels we get putrefaction, and from this we get phenol, propionic acid. This is a gas-house product, but it is not made by gas-house, and that is changed by the tissues to benzoic acid which then combines with glycocoll to form hippuric acid. If in addition to that beefsteak you also partake of fruits you will increase the hippuric acid to three or four times what you would get from a strictly nitrogenous diet, and the amount found in that case would be 4 grams, which would be equal to 2.8 grams of benzoic acid. If the professor were more familiar with the habits of our American-born people he would hardly take exception to the statement that catsup is used on bread, nor that it is commonly recognized as an article of food.

There was one statement made by Professor Hallberg in connection with gas-house products which I feel I must answer, namely, that the United States government allows the use of coal-tar products or colors made by the gas-house, providing the dye corresponds to the analysis as given in Green's edition of Schultz and Julius German Book. We have made a great many of these tests, but have never been satisfied with the requirements laid down by the United States government. From our tests we can furnish proof that certain colors which we have examined corresponded to the analysis or requirements as given in Green's edition of Schultz and Julius. We never take any chances. We feed it to the dog or guinea-pig in large doses, and if it does not kill the dog or the guinea-pig we feel safe in recommending that color. But we have fed to guinea-pigs samples of the seven colors allowed, which contain no mineral poisons, and which conform to the analysis as given in the book referred to, and which was satisfactory to the requirements laid down by the United States government. The color was, however, poisonous, in that it killed guinea-pigs, because there was something in the molecule of that dye which made it poisonous to them.

The United States government is not protecting us on that. If you are going to draw the line closely, do so, but let us not split hairs over the harmless benzoate and let down the bars on other things.

Professor Hallberg:—I am familiar with the state laws. The point I made was that the states had no general standard, and that helped to enact the Federal Act. In this connection I believe we will never get any uniformity in our state laws until we get a national department of health, and if this society locally has never endorsed that project I would suggest that it be done at the earliest opportunity. We are committed to a national department of health and we ought to get it.

Thomas E. Lannen, Esq.:—In reply to the remarks of Professor Hallberg, who stated that the national food law was passed as a standard for the states, I will say: I never heard that argument before anywhere in this country. The national food law is a regulation of interstate commerce, pure and simple, and nothing else. If anything survives, it must be the state law. It is a very serious question as to whether the national food law will be sustained or not, because it encroaches on the power of the states. It is regulating food that is reaching the consumer, and the state has regulated that identical food. If any law is a standard, it is the state law and not the national law. If any law must give away, it must be the national law, and not the state law.

Regular Meeting, Nov. 17, 1909.

Regular meeting of the Chicago Medical Society was held Wednesday, Nov. 17, 1909, with the president, John A. Robison, in the chair. The subject for the meeting was a symposium on "Exophthalmic Goiter." The following papers were read: "Medical Aspect," by M. M. Portis. "Pathologic Aspect," by Dean D. Lewis. "Surgical Aspect," by Alexander Hugh Ferguson. Demonstration: "Microscopic and Macroscopic Sections of the Eye," by L. N. Grosvenor. The discussion was opened by H. M. Richter, and was continued by Drs. C. B. King, Carl B. Davis, C. C. O'Byrne, D. N. Eisendrath, W. F. Coleman, C. C. Rogers and C. G. Buford, and was closed by the authors of the papers.

DISCUSSION OF THE SYMPOSIUM ON EXOPHTHALMIC GOITER.

The discussion was opened by Dr. H. M. Richter, who said: The papers of this evening have served to emphasize the present opinion or diversity of opinion as to the proper treatment of exophthalmic goiter. It is only natural that there should be some diversity of opinion regarding a disease whose life history extends over so long a period of time, and is so variable in its course. It seems to me that to-day we are justified in summarizing our knowledge of the subject as follows:

Without knowing what may be the factor that initiates the change, the recognized peculiar epithelial hypertrophy in the thyroid gland is the pathologic basis of disease. The symptoms of the disease are due to the ensuing change in the secretory activity—a toxemia—or to the secondary changes in the various organs

on which the toxic secretion acts. With the development and progress of the epithelial process there is inaugurated a secondary fibrosis whose tendency is first to bring about a spontaneous cure by means of a pressure atrophy, and, second, to progress beyond the physiologic requirements, and produce extensive destructive changes in the gland parenchyma. The histologic picture of the gland toward the end of a prolonged, severe type of the disease is one of general fibrosis, with epithelial desquamation.

In organs other than the thyroid, namely, the central nervous system, the heart, the various parenchymatous organs, the secondary changes that develop in cases that are allowed to run a prolonged severe course, become permanent, and account for the fact that these cases are not cured, even by the surgical removal of the thyroid. From these premises it seems to me that the following are logical deductions: That surgical interference is called for, 1, in those cases that show a moderate or high grade of severity; 2, in mild cases in which there is a history of a previous severe exacerbation. Surgical treatment is not called for in the very mild incipient cases, and will be of little use in those old cases in which the secondary visceral changes are permanent and not curable even by the removal of the original exciting cause. Proper, general therapeutic measures should be carried out as a preliminary to surgical treatment, to bring the patient to the best possible condition; but from the very nature of the process the improvement of the patient under these measures must be recognized as but temporary in a large proportion of the cases.

The operative mortality is influenced by several factors. Operation on a severe type of the disease without proper preliminary treatment is a mistake that will surely lead to a high death rate. Operation must be avoided during an acute exacerbation. Operation must not be too radical. These patients are not good surgical risks, and palliative operative measures should be carried out in many cases. Kocher, with all his experience and skill, averages three operations for every two patients, and we may well follow his plan.

There are but two points in the technic that I wish to emphasize. In the operation of ligation, the vessel should not be ligated outside the gland. Instead a suture ligation should be carried through the gland substance to include the vessels inside the gland, much after Dr. Ferguson's method of ligation preliminary to thyroidectomy.

In the operation of thyroidectomy the gland should be rapidly delivered through a free incision and the vessels clamped through the gland substance, taking a good bite of the latter with the forceps. After applying a total of three or four forceps the gland can be safely cut off distally to them. By this method this part of the operation can be completed in a few minutes. As to anesthesia. Rectal ether anesthesia is so simple and safe that it would seem to me to be the method of choice. But general anesthesia, whether rectal or otherwise, is surely demanded in a condition in which psychic shock is so grave a factor.

Dr. Clarence B. King:—It seems to me most of the points have been pretty well covered. The only thing I would call attention to particularly is an earlier diagnosis than is commonly made, and appropriate treatment begun at that time. Many of these cases, as we all know, particularly those of us who have seen a number of them, can be diagnosed before there is any marked tachycardia, and perhaps before there is any marked increase in the thyroid gland. The bruit that is heard in practically all cases at the base, in the majority of cases is heard often before any marked enlargement of the gland and before there is any great exophthalmos. If suitable treatment is begun early, putting the patient to bed, giving good hygienic treatment, with the elimination of a meat diet; as Dr. Portis suggested, avoiding mental shock and mental worry, it seems to me that many more of these patients will improve and there will be better results from medical treatment than we have been getting in years gone by.

I am not competent to speak of the surgical aspect of exophthalmic goiter, but I have been impressed considerably by the argument of the surgeons in the past year or so in talking with different ones. The thing that has impressed me more than anything else is the fact that they want to select

their cases, and the cases they have selected to operate on are those in which the exacerbation has subsided; they are cases which perhaps the internist has not cured, but they are getting well. In those cases the surgeon obtains beautiful results from operation. I have in mind a surgeon on the West Side who has had a death rate from operating on these cases, the advanced ones, of 100 per cent. I have found that galvanism improves many of these cases. I do not say that it improves all of them, but I have seen very good results in a number of instances. It is true that while these cases improve very slowly they do get well. I do not claim anything for internal treatment. I do not claim to cure these cases, but, like a great many other diseases, patients with exophthalmic goiter get well spontaneously.

Dr. Carl B. Davis:—Concerning the internal secretion of the thyroid gland, I would like to report the following case: I performed a panhysterectomy in a patient showing a small nodule, apparently no adenoma, in the right lobe of the thyroid gland. This nodule had been present for a number of years without any apparent change. The patient made an uneventful recovery. Two months later she developed a pulse rate that remained above 100. The right lobe enlarged and a tremor and general nervousness developed. Her condition progressed until at the end of three months there was the typical picture of hyperthyroidism. There was no exophthalmos. Patient returned to hospital and the right lobe was removed. There followed a rapid subsidence of symptoms. It is now four months since the second operation and the patient is in normal condition.

In discussion of the case with J. Clarence Webster he informed me that he had performed panhysterectomy in a number of patients showing thyroid enlargements of various kinds. His results had been negative except in a few cases. In one patient there was a previous history of Basedow's disease which was present at the time panhysterectomy was done. This woman died after a short interval with the picture of hyperthyroidism.

Rehn reports a case of thyroid tumor where a double oöphorectomy was performed; the patient died a few weeks later with the picture of hyperthyroidism.

It seemed to me that the result in my case might have been more than a mere coincidence. In attempting to repeat the condition I have removed both ovaries in a number of dogs showing various enlargements of the thyroid gland. The experimental work has been done so recently that I can give no definite report as yet.

Dr. Charles C. O'Byrne:—I have been very interested in this symposium. I would not operate on a case of exophthalmic goiter during an acute exacerbation. I believe, however, there is a period when every case of exophthalmic goiter is a surgical one.

With regard to the primary and secondary types of the disease, many of them if operated on promptly recover. Early operation is exceedingly satisfactory. In the so-called secondary cases the gland may be very much enlarged. I remember the case of a medical student in whom the symptoms were so marked that the young man was nearly compelled to give up his medical course on account of insomnia. He went home, and after resting on a farm for a time returned in a very good condition. He resumed his medical studies, but during the course the insomnia returned. He asked me what I thought was the cause of his insomnia. I examined him, and deep palpation disclosed a nodule in his neck as large as an English walnut. His pulse was nearly one hundred. Insomnia was the notable symptom. After this growth was removed from the neck there was a subsidence of all symptoms within a week. Drainage was unnecessary. The operation was easy and was not attended with danger. The dangerous cases are those with primary enlargement of the gland.

I saw within the same month the case of another student of the same class. This boy came under the observation of Dr. Ochsner, and he will doubtless remember the young man who was suffering from the most severe acute hyperthyroidism it has been my privilege to see. He was put under medical treatment for a number of months, improved, and went home. After a year the disease recurred, and he died within a short time.

I was rather surprised to hear Dr. Zapffee speak of using such large doses of chloretone in the report he read for Dr. Ferguson. I certainly would not take fifty grains of chloretone if I were in my right senses.

I do not think anesthesia was mentioned in connection with the surgical aspects of exophthalmic goiter. I have operated on a number of these cases under nitrous oxid anesthesia, and it has proven very satisfactory. It certainly acts nicely in some of these cases.

Dr. Daniel N. Eisendrath:—I would like to pass around a specimen which I think may be of interest to the members of the society. It shows the inefficacy of one of our methods of treatment of exophthalmic goiter. The details of the different methods of treatment were unfortunately not mentioned on account of the omission of Dr. Ochsner's paper. This specimen was taken from a patient who submitted, at first, about six months ago, to medical treatment for a considerable time, and was then handed over to the surgeons at the Michael Reese Hospital. The patient was a girl, 20 years of age, and when she was first operated on her pulse varied between 132 and 140. She had all the classic symptoms of well-marked hyperthyroidism. At the first operation the right lobe of the thyroid was extirpated. The symptoms did not improve after the removal of the lobe. Then the superior thyroid outside of the lobe was ligated. The symptoms did not improve. About six months after the original ligation on the left side, the right lobe having been removed nearly nine months before that, she came into my service at the Michael Reese Hospital last spring. I found a recurrence of practically all symptoms. The specimen shows what is becoming more and more the belief of surgeons, namely, that ligation of the arteries alone is not sufficient; that we must use more radical surgical measures in the treatment of exophthalmic goiter in many cases. The specimen shows a considerable number of cysts filled with colloid material, and the remainder the parenchymatous type, showing papillary ingrowths, and cytolysis, which was referred to by Dr. Lewis. is one of the characteristics of the pathology.

There are certain features in connection with this subject which I think cannot be omitted. Dr. King has cast a little doubt on the ability of the surgeon to take care of these cases. We do not want the mild cases nor the extremely severe ones. The extremely severe cases have been emphasized by Dr. Ferguson and by every surgeon who has had any experience with these particular types of cases—those which show cardiac changes, etc. These are the cases in which organic changes take place in the heart muscle. They are subjected to considerable rest treatment before surgery is undertaken. These are the cases which, with the best of preparation to overcome the psychic effect of the operation, whether given chloretone or put on rest treatment for a week or two, will, without warning, die on the table from a goiter heart in spite of every effort and a perfect technic. This has happened in the last year in the experience of three surgeons in this city, so that I do not think the dictum ought to go forth, in the first place, that every case of exophthalmic goiter is an operable case. In the second place, every one who has had experience in the surgical treatment of exophthalmic goiter knows, as has been pointed out by Dr. Lewis in considering the pathology, and again by Dr. Ferguson in the technic, that exophthalmic goiter is not like an ordinary goiter on which to operate. The vessels are brittle; there are a large number of adhesions; you have got a poor subject to deal with in a majority of cases; the anesthetic is borne badly, and the operation should be performed by a surgeon of considerable experience. A choice of cases should be made especially, and this should be impressed on every one who sees cases of this kind. The case must be looked into very carefully with reference to the condition of the heart. If the heart shows organic changes, then the patient should be subjected to medical treatment.

In regard to one point which Dr. Portis brought out, I do not know whether he is familiar with the later work of Beebe or not, but it is a work which should not be neglected. Dr. Beebe, at a recent meeting of the Mississippi Valley Medical Association, reported over four hundred cases of exophthalmic goiter which had been treated by his serum, and in the majority of them there has been permanent recovery. We do know that, in spite of medical treatment, these cases relapse.

In spite of surgical treatment a certain proportion of cases relapse. If a case does not show any recurrence inside of six months or two years we can regard that case as cured. I think surgeons ought to take a middle ground in the consideration of this subject, and that we ought to have the cooperation of medical men in this disease the same as we have it in a great many others. We ought to be consulted in those cases in which medical treatment, either serum or rest, has been tried for a time, and then if the patients do not improve we should operate on them.

Dr. W. F. Coleman:—In regard to the electrical treatment of cases of exophthalmic goiter, Dr. Portis said that the *x*-ray had proved of doubtful utility. In fifty-one cases reported by one observer about 70 per cent. of them were cured. In a large number of statistics 75 per cent. of the cases treated by the *x*-ray have made satisfactory improvement.

The other electrical means of treatment in vogue are the galvanic, the high frequency and the static currents. As to the dosage mentioned by the essayist of two to four milliamperes, I will say it depends on the size of the electrode and may vary from 5 to 50 ma.

There is a general impression that electrolysis is necessarily confined to the direct or galvanic current, because it has a constant polarity, but more important than the polar effect is the interpolar effect of the alternating current, which since 1902 I have maintained is electrolytic, and since 1907 scientists abroad have demonstrated it to be.

As to the pole to be used, it is usually stated that the negative must be used. The negative increases the pulse rate, whereas the positive pole lessens it and should be used in tachycardia. The use of the *x*-ray increases fibrosis of the capsule, but it also increases the friability of the tissues, as Dr. Ochsner and others have observed, and if the surgeon has to operate afterwards he is put in a very embarrassing position by the hemorrhage.

As to the different currents used, I have had quite a little experience and will cite one case in which I used the high frequency, the direct and the alternating currents. I used the high frequency locally and generally with couch for one month daily without any improvement in the size of the goiter. I then put her on the galvanic current for one month daily and she improved, so that there was three-quarters of an inch lessening in the size of the thyroid, with lessened tachycardia and general improvement. The alternating current in the third month improved the patient more rapidly than any other, so that at the end of this month she was practically well in every respect.

The use of the alternating and high frequency currents one might dilate on very much because of the trophic changes produced by increasing the respiratory capacity of the blood, the elimination of urea, uric acid, phosphates, chlorids, etc., changing metabolism and improving general nutrition. We must not confine our treatment to the gland but treat the eyes also electrically. For the general benefit of the patient I believe the high frequency current by the couch is the most convenient and effective means of treatment. Locally, I think the best current to use is the alternating current.

Dr. C. C. Rogers:—A short time ago a patient was operated on, one ovary having been removed and a portion of the other, soon after which she developed the typical symptoms of exophthalmic goiter. Her case was considered a medical one. She was therefore taken to a sanitarium, and it was thought she could be cured by the internal medication, but she was not out of bed during her three months' stay in the sanitarium. Her symptoms increased; she was placed in the Willard Hospital on absolute rest, with an ice-bag applied over the heart for two weeks, at the end of which time she was operated on, and the larger portion of the gland removed. She walked out of the hospital in two weeks' time thereafter, and has gained sixty pounds in weight in five months.

Another case that came under my observation was a married woman who, when she was pregnant, had no gastrointestinal symptoms. A few weeks after parturition gastrointestinal symptoms reappeared and remained, attended with diarrhea, the bowels moving six or seven times a day until she became pregnant

again. Then the bowels regulated themselves, and there were no gastrointestinal disturbances. This condition continued through three confinements. She had a goiter. I diagnosed exophthalmic goiter, removed the goiter, and she has had no gastrointestinal symptoms since.

I do not believe that the relation between exophthalmic goiter and the uterus or pelvic organs is known, but there would seem to be some relation between the thyroid gland and the female genital organs.

Like Dr. O'Byrne, I believe cases of exophthalmic goiter are all surgical at some time. They are medical at the beginning, and they are medical usually when they are turned over, the extreme cases, to the surgeon. As Dr. Ferguson has pointed out, once in a while a case that seems to be hopeless in every way can be operated on and get entirely well. It has been said that we as surgeons operate on these cases when they are nearly well. When they are practically well under internal medical treatment, then is the time to operate on exophthalmic goiter. In other words, we should operate between exacerbations just as we would operate for recurrent attacks of appendicitis in the interval. In this way we get good results. We cannot very well operate on exophthalmic goiter when the patient is having acute exophthalmos without killing her. The cases are medical then. They are surgical cases when the internal medical man can get them just as well as he can.

Dr. Coleman G. Buford:—My attention was again directed to ligation of the thyroid arteries through experiments related in that excellent article presented here a few months ago by Dr. Werelius. In discussing his paper I expressed some doubt as to the value of ligation of these vessels in connection with the treatment of goiter of any form, and I emphasized the opinion that its use could not become very general. I expressed that doubt wholly on my familiarity with the literature which relates what has been accomplished in the past in practice. The literature abounds in these experiences and dates back to the time of Billroth and even before his time. Because of the favorable outcome of the doctor's experiments on dogs, I promised myself that I would try ligation of the arteries in the first case of exophthalmic goiter that presented itself and was suitable for this procedure. Within a few weeks such a patient presented herself. I ligated the vessels, both superior thyroids, under local anesthesia, doing it in a very few minutes, the patient making no complaint. When the first vessel was ligated, the patient's physician, who was observing the pulse, a very capable man, one who has done much work along the line of blood pressure, told me that within two or three minutes there was a noticeable diminution of the patient's blood pressure. This patient's blood pressure had been about 180 right along before the ligation: but when taken about two weeks later it was only 130, which is also the present reading. Another interesting point in connection with this case is that the circular measurement of the neck, which was 15½ inches before we operated, a week later was 13½ inches, and has remained so up to the present. It has been about four months since the operation. This patient was very much better for a time; her cardiac symptoms were improved promptly, and the exophthalmia gradually subsided. I have her photographs showing her eye symptoms before and after operation. To-day this patient has no exophthalmia, yet her eye symptoms were pronounced before ligation. There was a temporary improvement both in the cardiac symptoms and in the tremor. After a little while, perhaps six weeks, most of the symptoms again became pronounced, so that now she has tachycardia, a pulse count of 140; the tremor is increasing; there is considerable insomnia, much disturbance of the heart, and I am going to do a thyroidectomy for her very soon.

Dr. Richter has spoken of ligating these vessels within the gland. When Dr. Werelius presented his paper before this society I wondered at the time whether this method of ligation was not a dangerous procedure. I think it is. We have no assurance that we are not going to puncture vessels lying within the gland and have a severe concealed hemorrhage. I prefer very much to bluntly dissect up and expose the vessels, and ligate as in my case; I ligated both sides at a point just before the artery penetrated the gland. I had no trouble whatever from

tetany; and we must remember that authorities are not agreed as to the value of the parathyroids. Some say we get tetany if we destroy the vessel supply to the parathyroids while others say not.

Dr. M. M. Portis:—As the hour is late I will not say very much concerning the surgical aspect of exophthalmic goiter. Nothing has been said in the discussion or questions asked regarding the medical aspect of these cases for me to respond to.

There are two things I want to emphasize as a humble internist, which appeal to me from the surgical side. I agree with Dr. Ferguson that the operative treatment to-day is really better than medical treatment, although the use of Beebe's serum may change that view. However, it is not the treatment of the future, for the reason that it does not seem rational that a surgeon should operate for a hyperactivity of the gland. It is a rather anomalous thing when you think about it. I do not know of anything else in a surgical line where one operates for hyperactivity of an organ. That is one point. The other point is this: I am not impressed so much with Kocher's statistics as are some surgeons. I believe more credit belongs to the statistics of some of our American surgeons and other foreign surgeons, who see their cases in regions where there are not so many primary non-exophthalmic goiter cases. Most of Kocher's cases belong to the secondary type, as has been described by Dr. Lewis, and the mere fact that his operative mortality is so low and his results so good, should be accredited on the ground that they are secondary types in the majority of cases rather than primary. I will say, however, I am more impressed with statistics of large numbers of cases where the patients have the primary type of the disease.

In the future Beebe's type of serum, or some other thyrotoxic serum, which will destroy the thyroid *in situ*, will probably be the ideal treatment.

(*Discussion continued on page 260*)

CHICAGO MEDICAL SOCIETY—ENGLEWOOD BRANCH.

The Englewood Branch met Nov. 2, 1909. It is very gratifying to report that the members of the Englewood Branch are making an earnest effort to utilize the exceptional supply of clinical material which the district furnishes.

This is a matter that has been more or less neglected in the past, partly because we did not realize that we had so much and partly because we were somewhat timid about asking our patients to come to the meeting.

The courtesy shown by the hospital management in permitting the use of hospital cases and in caring for those that come from the outside, together with the interest shown by those having the matter in charge, have made this feature of our meetings intensely interesting to earnest seekers for knowledge. And the end is not yet.

Commencing sharply at 9 o'clock, thirty minutes were taken in showing the following interesting cases. Lack of time unavoidably prevented several others from being brought before the society:

Two sisters, aged 10 and 16, with typical Graves' disease. The younger had been operated upon with very good results, the other was still under preparatory treatment looking to the same procedure.

A woman aged 56, with history of swelling in the front of the neck which interfered with breathing and which was very much improved, the swelling, an enlarged thyroid, diminishing rapidly under the use of thyroid. Later patient was treated in similar manner but soon developed symptoms of hyperthyroidism and treatment had to be discontinued. Both this and the previous cases were examined by a large number and were the subject of considerable informal discussion.

A woman with large postoperative ventral hernia.

A woman, aged 48, with femoral hernia size of child's head, thought to contain ovary, tube and omentum, of thirty-five years duration. Recently causing much pain and discomfort. Both the above cases were in the hospital for operation and an invitation was extended to all present to attend.

Young man with very severe crushing injury to the thumb and hand, thumb being held on only by a few strips of tissue, presenting a perfect scar and with very good functional and cosmetic results.

The society wishes to acknowledge its indebtedness to all who presented cases, especially to Drs. Friend and Lackner for the two cases of exophthalmic goiter.

Dr. Haeberlin read a very comprehensive and instructive paper on "Hyperthyroidism." Dr. Werelius showed a dissection of a thyroid in a living dog and demonstrated the surgical anatomy as seen in animals. He then read a paper on "The Pathology in One Hundred Goiter Dogs," concluding with a demonstration of slides of gland and blood findings. Dr. J. B. Herrick then opened the discussion and was followed by a considerable number who availed themselves of the opportunity, and many interesting points were brought out.

The new manager of the bureau, Dr. J. W. McMahan, was present and was invited to tell the society about the new plans and arrangements of the Business Bureau.

It was evident that the members were also interested in the practical side of medicine and that the Englewood Branch would do its part in the support of the Bureau. Attendance 72. C. HUBART LOVEWELL, Secretary.

HYPERTHYROIDISM.*

DR. JOHN B. HAEBERLIN.

The anatomy, macro- and microscopic; physiology and functions of the normal thyroid gland will be omitted on account of limitation of time.

The thyroid gland belongs to the ductless glands whose internal secretion is necessary to the normal bodily economy. Histologically the gland is very vascular and rich in lymphatics so that it may find this its means of spilling or feeding its products to the organism. We know experimentally that the bodily condition varies with the amount of thyroid secretion or substance supplied to the economy. We may have, therefore, a decreased amount of secretion, or a normal secretion, or an increased amount of secretion. This first condition then would be a hypothyroidism, which is demonstrated clinically as myxedema, juvenile and adult myxedema, myxedema-strumipriva and cretinism.

The second, normal thyroid secretion in which the balance of thyroid supply is sufficient for the individual's normal condition, which would give us a normal physiologic gland. There is in this condition a metabolic equilibrium which is normal.

Third, increased secretion, or hyperthyroidism resulting in the clinical picture which is known as exophthalmic goiter. If one were born without a thyroid entirely one would not belong to this classification. The thyroid being ductless, secretion would be endogenous. Hyperthyroidism then would be an endogenous intoxication of probably altered thyroid secretion to the animal economy. The secretion is undoubtedly altered qualitatively as well as quantitatively.

What then is this substance that produces hyperthyroidism? In the year 1886 Moebius was the first to bring the secretive theory of exophthalmic goiter forcibly to the profession. Bauman of Freiberg was probably the first to isolate the active principle of the thyroid gland. His iodothyrin or thyroiodin has been proven experimentally to be probably the active principle of thyroid secretion. The thyroiodin of Bauman contains iodin found only in organic combinations, a protein molecule. Oswald isolated a thyroglobulin, but it is not active. The thyroiodin and thyroglobulin are found in the colloid and not in the cells of the glands. The active principle as it circulates in the fluid medium of the body has not been determined. Thyroiodin can be administered in conditions of hypothyroidism with favorable results. Thyroiodin when given to individuals with hyperthyroidism increases the symptoms. Important experimental work has been done along this line by Bauman, Greenfield, McCallum, Moebius, Kocher, Ross, Magnus Levy and others. The amount of iodin in the

* Read before the Englewood Branch Chicago Medical Society, Nov. 2, 1909.

thyroid gland would indicate that iodin is an important factor in its influence upon thyroid metabolism. Experimentally we find from 2 to 9 milligrammes in a whole normal thyroid gland. Hyperthyroidism influences various species differently. We know that the herbivorous animals contain the highest iodin content in their thyroid glands, whereas, the omnivorous come next and the carnivorous last. We also know that the carnivorous suffer most from thyroid extirpation and the herbivorous least. We know also that they are greatly influenced by the type of diet they receive following thyroidectomy. From this fact many authorities recommend a meat-free diet in the treatment of hyperthyroidism. The above facts also lead us to believe that iodin administration is valuable in hypothyroidism. We certainly know its value in goitrous conditions. The thyroid gland is not the only gland that contains iodin. The other ductless glands, such as the pituitary bodies, thymus, parathyroids, spleen, suprarenals and ovaries also are said to have an iodin content. There may be an interrelationship between the secretory substances of all the iodin-containing glands. Tbis is still open for determination.

What are the proofs of hyperthyroidism and hypothyroidism? We have a number of things which are apparently positive proof that the clinical symptoms of the disease known as Graves', Perry's or Basedow's disease, or exophthalmic goiter, are due to hyperthyroidism:

1. Extirpation of the thyroid produces a condition called myxedema-strumipriva which closely resembles the clinical myxedema.

2. Myxedema-strumipriva and clinical myxedema are benefited or cured by thyroid administration.

3. Exophthalmic goiter has many symptoms that are directly opposite to those of myxedema.

4. Symptoms practically identical can at times be produced by excessive thyroid feeding.

5. Thyroid feeding to an exophthalmic goiter patient aggravates the symptoms.

6. Exophthalmic goiter is relieved or cured by the partial extirpation of the gland—in other words by reducing the amount of internal secretion fed to the organism.

7. Histologically myxedema shows degeneration and inactivity of the gland; this means less secretion.

8. Histologically exophthalmic goiter shows marked proliferation of the gland parenchyma along with increased secretion.

9. There is increased elimination in hyperthyroidism and exophthalmic goiter.

10. There is a decreased nitrogenous elimination in myxedema and myxedema-strumipriva.

11. In studying the pathologic metabolic changes in myxedema and exophthalmic goiter there is a marked likeness to the processes produced artificially first, by gland extirpation and secondly, by gland overfeeding.

But what produces hyperthyroidism and hypothyroidism? The real causal element producing these conditions of the thyroid gland is unknown. The influences brought to bear upon the thyroid to be over or under active in its internal secretion is simply a matter of speculation. It was in 1840 that Karl von Basedow, a shrewd clinical observer, published in Casper's Wochenschrift his article, "Exophthalmos from Hypertrophy of the Cellular Tissue in the Orbital Cavity." Little did he or any of the other pioneer workers on the disease think that the symptom complex was due to an increased secretion of the thyroid gland. It was Moebius who really gave this its first impetus. Since the time of Perry in 1825, Graves in 1835, von Basedow in 1840, and others, there has been much work done and much theorization or speculation as to the clinical entity or symptom complex comprising the condition of exophthalmic goiter. Hand in hand practical experimental work had been going on until the theory that this condition was due to hyperthyroidism was advanced. Since then each succeeding experiment, both animal and man, tends to prove that this theory is correct, and to-day practically nearly the entire profession takes this view, viz.: That the disease

which is named exophthalmic goiter is due to an altered thyroid secretion, quantitatively as well as qualitatively. We have passed through the hematogenous and neurogenous theories and have landed at present on the thyrogenous theory which is apparently correct. That the clinical symptoms of exophthalmic goiter are due to hyperthyroidism I believe there is no doubt. We have some twenty or more symptoms of hyperthyroidism but the four essential to diagnosis are, tachycardia, goiter, exophthalmos and tremor.

What is this poison that produces these symptoms? Iodothyrin seems to be it, but many claim otherwise. We know what its results are but we do not know positively what it is. A peculiarly important fact that presents itself very forcibly is that hyperthyroidism produces marked symptoms of derangement without any organic change; then as soon as the poison is withdrawn the organ becomes normal. There is no carditis following tachycardia, no gastro-enteritis following excessive vomiting and diarrhea, no pathologic skin findings accompanying the excessive sweatings. In fact, according to Thompson, autopsies on exophthalmic goiter show only goitrous changes. There is no doubt but that these symptoms are due to the poison produced and secreted by the thyroid gland. Thus, hyperthyroidism may be very mild or very severe, leaving its telltale story on the system. We may have hyperthyroidism so slight that a diagnosis is very difficult or impossible. It may give us clinically the *formes fruste* type of the trouble, or it may be prolonged and chronic giving us our long, severe case of exophthalmic goiter, or it may be intermittent recurring at more or less frequent intervals. There is a fulminating, malignant type of hyperthyroidism, a number of cases having been reported.

In hyperthyroidism we have a hyper-active gland. There apparently seems to be an interrelationship between the different varieties of internal secretion. In hyperthyroidism persistence of the thymus is the rule. What this means we do not know. The complemental relationship of the parathyroid is still in a doubtful state. The parathyroids probably have nothing to do with the thyroid. They are closely related anatomically but functionally they differ from the thyroid. The pituitary body is apparently related, Adami giving an instance of gross change in this body in a case of exophthalmic goiter. The adrenals also have some functional relationship accorded them by Sajous. According to his view they are all important but he is probably incorrect. The spleen was thought to bear a relationship but it does not. The sexual organs probably have an interrelationship with the thyroid gland. We know that the thyroid likes to enlarge during puberty, menses and pregnancy. Nephritis occasionally occurs with altered thyroid secretion. It has been proven experimentally that the thyroid secretion, whether hypo or hyper, below or above normal, has a marked influence on metabolism. It seriously influences protein and carbohydrate metabolism. We have principally disturbances of energy, weight and secretion. Von Noorden, in giving the pathology of metabolism of the thyroid gland in hypothyroidism and hyperthyroidism, classifies the metabolism as follows: Energy exchange; protein and carbohydrate metabolism; urinary changes; sweat formation; and food absorption. In hypothyroidism there is generally speaking a diminished metabolic activity of the above specified classification; in hyperthyroidism the opposite is produced. We have a diminished or an excessive pathologic metabolism in process. In normal thyroid secretion we have a happy equilibrium in our metabolic process. Another fact regarding the secretory activity of the thyroid gland is that its size has nothing whatever to do with its activity. This has been proven histologically and clinically. We may have a large colloid goiter and still have no hyperthyroidism, or it is possible to have a very small goiter producing hyperthyroidism of the severest type. Histologically the gland may show areas of localized activity scattered throughout the gland which, so far as is known, does not conform to any law or order. Apparently the amount of hyperthyroidism depends upon its histologic activity, the opposite being true of hypothyroidism. One may have a very small portion of the gland producing a very active secretion and producing marked poisoning, whereas we can have a large gland with a mild poisoning. It is generally thought that the toxic element

produced by the thyroid gland is of thin secretion and not eosin stainable in histologic preparations, whereas the portion of the secretion which fills the vesicles and takes the stain readily is considered by some to be the complement of the poison producing hyperthyroidism.

The thing about hyperthyroidism that to me is most striking clinically is that it is a self-limiting disease. All those who have treated any of these cases know how helpless one is in the treatment of them. Rest, both physical and psychical; ice bag to the heart; bland diet; caring for the elimination; the sedatives, as opium and its derivatives, and a few other drugs seem to help at times. Electricity may be tried and the serum treatment seems unsuccessful. The noticeable feature of the whole matter is that we have no specific. Still, how great a percentage of these cases recover? In the recovery we simply have a process in one's economy which so influences the gland as to cause it to become less active, or there may be an anti-body produced to counteract the poison. The patient may completely recover, be improved or remain stationary, or the hyperthyroidism may advance until a fatal issue. In these fatal and severe cases there is no proof against its being a self-limiting disease. In our infectious self-limiting diseases we also have at times fatal termination. The fatal termination from hyperthyroidism simply indicates an inability of the system to counteract or control the poisons. We have all degrees of hyperthyroidism from the *formes fruste* type to the fulminating, rapidly fatal type. The fact that we have a gland whose secretion may be above or below normal shows that we have a fluctuating condition present and that in the normal there is a mean or average secretion. This makes one think of self limitation. In hyperthyroidism the gland proliferates, over-functionates and then degenerates. In our cured cases of exophthalmic goiter when the gland is examined histologically we find that the gland indicates a degenerative process which probably is brought about by the self-limiting action of the system. In the severer types after due waiting the hyperthyroidism may be reduced by extirpation or in extremely dangerous, fulminating cases by the Werelius operation, this being a ligation of the vessels supplying the gland and a large purse-string suture placed in the parenchyma of the gland. This operation simply cuts down the amount of the thyroid secretion fed to the economy. It also helps the gland to degenerate, which in turn produces less thyroid secretion.

Another very noticeable thing is that hyperthyroidism bears no relation to the other types of enlargement, although one with a simple goiter may develop a hyperthyroidism, but simple goiter per se has no relation with exophthalmic goiter. I believe that hypo- and hyperthyroidism should be classified as metabolic diseases due to faulty internal secretion, not as it is now classified in most text-books as exophthalmic goiter under the head of nervous diseases. The nervous element is simply a symptom of the disease. It should be classified with other diseases we know that are due to faulty internal secretion as Addison's disease; acromegaly; perhaps diabetes; eclampsia and some digestive diseases may belong to this classification. It is also my belief that as we grow to understand the physiology and the pathologic physiology and chemistry of organs which have an internal secretion that we, as medical practitioners, will have a firmer footing and a better understanding in treating these conditions. Just as our truth and knowledge have increased along the line of infectious disease so are we growing along the line of internal secretion. It apparently appears that the future progress along hyperthyroidism will be a clearer understanding of its secretion along with the refinement in diagnosis; that is, with different clinical aspects of hyperthyroidism there will be definite histologic changes to account for it. Early diagnosis always indicates refinement of knowledge and methods. There is, I believe, a definite relation of symptoms to the histologic findings. We have in hyperthyroidism different degrees of symptoms varying with different degrees of thyroid involvement. Wilson, having analyzed pathologically 294 cases, found that certain pathologic pictures repeated themselves so much that they were divisible into four large groups; many, however, apparently form a connecting tie between each group. The clinical history and symptoms were

carefully avoided so that there would be no bias of opinion. This was done before he referred to the history of the clinical case and he found that he was quite accurate in his prognosis. Those who wish for the full classification showing the inter-relationship of symptoms with the pathologic condition of the gland I refer to his work.

Of what use is this knowledge of the thyroid? Previous to 1855 the attention of the profession was all toward external secretion. It was the only condition that they at that time were able to demonstrate. The finer methods of research were not theirs. Claude Bernard, in 1855-57, demonstrated the existence and importance of internal secretion. His work was on the liver, showing how the liver stored up glycogen and gave it out as sugar as demands were made upon it for its use. The results gained from our knowledge as it stands at the present time are wonderful. Only those who have watched the cretin brighten from a dull, listless creature to one of some usefulness in the world can appreciate the results. Again, in myxedema we have marvelous recoveries; all done by supplying a want. On the other hand, those having exophthalmic goiter are greatly benefited by our knowledge of internal secretion. In exophthalmic goiter we watch for a curing or self-limitation of the process and place the patient under conditions to favor recovery. Then if the hyperthyroidism seems progressive and persistent the condition is relieved by operation. A partial extirpation of the gland is done and the deleterious internal secretion reduced. If we are fortunate enough to extirpate the diseased portion of the gland and leave enough for normal supply the results are very gratifying.

I wish to refer to the thyroid work of Werelius. He is in our midst and deserves great credit. His conclusions drawn from looking over the literature and from his own research work, are valuable help. Original work should be encouraged, for it is original work that benefits the entire profession.

CUMBERLAND COUNTY.

The Cumberland County Medical Society met in regular session at the Court House in Toledo, September 21, at 2 p. m. The meeting was called to order by Dr. R. L. Kurtz, president. The minutes of the previous meeting were read and approved. The report of the committee on a fee bill was read and approved. A motion was made, seconded and carried that the secretary submit a copy of this fee bill to every physician practicing in Cumberland county for their signature. Dr. R. L. Kurtz then read a paper on "Repair of Median Nerve, with Report of a Case," which was discussed by the members present. The society then adjourned to meet in Toledo on the second Tuesday in November, 1909.

WILL L. SMITH, M.D., Secretary.

REPAIR OF MEDIAN NERVE, WITH REPORT OF CASE.

RUSSELL L. KURTZ, M.D., NEOGA, ILL.

Without offering any apology for selecting a topic so common as nerve repair, I shall ask your indulgence while I detail an apparently trivial case, which later, however, figured very materially in the future usefulness of the most important member of the body in so far as earning a livelihood was concerned, viz., the right hand. July 21, 1908, Mrs. M. T., Trilla, Ill., housewife, aged 26 years, consulted me with a crippled hand presenting the following conditions: An irregular cicatrix 1 to 1½ inches long extending transversely across right forearm on the palmar side about one inch above the wrist. The skin was cadaverous, dry, slick as though varnished, with a sub-normal temperature requiring a yarn mit for warmth, though the patient's body was perspiring freely from the July heat. She gave the following history: On July 11, 1908, while endeavoring to unscrew a glass fruit jar, the jar was crushed and a small triangular portion of glass penetrated the arm above the wrist, producing intense pain, faintness, nausea, profuse bleeding, with wrist drop and loss of use of the hand. A physician dressed the wound the same day by applying two skin sutures of silk, which were allowed to

slough out as evidenced by the scar that union was by granulation. Her husband remarked that "two white glistening cords" (as he expressed it) were protruding from the wound but were not united. Loss of motion and sensation extended over the following areas, viz., entire hand dropped to complete flexion. Could be pronated only with assistance of other hand or by rolling of forearm. Flexion of all fingers except the little finger was lacking; there was some movement of the metacarpo-phalangeal joints, however. One peculiarity was the lack of ability to oppose the thumb with index finger. The entire hand was flexed to the ulnar side with visible atrophy of muscles. Sensation was absent on palmar surface of thumb, index and middle fingers and on radial side of ring finger, also extending well up palm of hand. The dorsal surface of hand and thumb was unaffected, but anesthesia of posterior surface of index and middle finger existed, gradually disappearing on radial side of ring finger. Points of greatest anesthesia appeared to be tips of index and middle fingers, the former was slightly gangrenous at its tip, the dry type of gangrene, which extended back under the finger nail. Patient stated that index finger had swollen and end of index finger ruptured soon after union of original wound. In the center of the dry gangrene was an excavated ulceration, which proved not amenable to antiseptics but later, after union of nerve, voluntarily healed without local medication. November 11, 1908, just four months after date of injury, with the assistance of Dr. G. T. Ragan, we cut down to the nerve, removed old cicatrix, picked up the severed nerve, clipped off the bulbous ends and united them with plain No. 3 catgut. Apposition was made by removal of a "V" shaped portion from proximal end and the introduction of the distal end, made wedge-shaped to fit this aperture. The ends had separated possibly one inch but were readily brought together without much tension on sutures. Although the original wound was transverse, the fascia was divided longitudinally parallel with the long axis of the nerve, and closed with No. 1 gut, fine silk worm gut being used for skin. By the use of a sterile Esmarch, a bloodless operation with minimum of trauma was obtained. The arm was placed in a cravat sling with curved metallic splint for carrying hand flexed. No improvement was noticeable until the end of seventy-two hours, when patient complained of "pins and needles" sensation in ends of fingers. At the end of one week slight tactile sensation discernible in ends of fingers; motion unimproved; ulcer at finger tip healing. At end of one month sensation had completely returned and small objects, such as a book or drinking-glass, could be grasped firmly. She was given faradic current with massage for weeks. At the end of twelve weeks she was able to carry a two-gallon bucket of water and resume her general housework without any inconvenience. After a lapse of over one year the normal condition of hand continues.

RECAPITULATION.

1. Small punctured wounds may sever important nerves without injury to subjoined tendons or other important structures.
2. A complete restoration of the right hand; the most important member for the bread winner.
3. Sensation in mixed nerves returns early while restoration of motion is very slow.
4. Postoperative treatment is nil short of faradism and massage.
5. Degeneration begins at the distal end of severed mixed nerves.
6. A complete diagnosis should always be made in even minor injuries.

DOUGLAS COUNTY.

The regular quarterly meeting of the Douglas County Medical Society was held in the Knights of Pythias Hall, Tuscola, Friday, Jan. 7, 1910, at 2 p. m. Dr. John Ewing of Tuscola presided. Other members present were Drs. Martin, Reat, Rice, Wiseman, Hall, Carmack, Pinckard, Rutherford, Hilgenberg, Eads, Fuller, Hanson and Blaine. The minutes of the last regular meeting were read

and approved. Dr. J. W. Hamilton of Mount Vernon, one of the state lecturers, then gave the society a very interesting and instructive talk on "Reflexes and Their Significance," laying special stress on their aid in diagnosis. He was followed by Dr. Walter B. Metcalf of Chicago with a paper on the "Treatment of Tuberculosis," in which he emphasized the value of tuberculin as a diagnostic as well as therepeutic agent. There being no other papers the society adjourned.

JOHN EWING, President.
W. C. BLAINE, Secretary-Treasurer.

EFFINGHAM COUNTY.

At the last meeting of the Effingham County Medical Society, Dec. 14, 1909, the following resolutions were unanimously adopted:

WHEREAS, It has pleased the all-wise Creator to remove from our midst an honored brother and member, Dr. W. H. St. Clair; therefore be it

Resolved, That we, the members of the Effingham County Medical Society, hereby express our deep sorrow in the death of Dr. W. H. St. Clair. He was one of our oldest and most honored members, having been for several years the vice-president of this society. He was also at the time of his death a member of the American Medical Association; and be it further

Resolved, That in memory of the deceased these resolutions be sent the family as a token of our esteem for them and as an expression of our regard for our late comrade.

P. I. CROMWELL,
F. BUCKMASTER,
C. F. BURKHARDT,
H. LAPHAM, SR.
Committee.

The following officers were elected for 1910 by the Effingham County Medical Society: President, Dr. P. I. Cromwell, Effingham; first vice-president, Dr. J. N. Mathews, Mason; second vice-president, Dr. F. Buckmaster, Effingham; secretary, Dr. H. Taphorn, Effingham; treasurer, Dr. C. F. Burkhardt, Effingham; member medicolegal committee, Dr. L. Dunn, Elliotstown; delegate to meeting of state society, Dr. C. F. Burkhardt; alternate, Dr. E. L. Dannon, Effingham; board of censors (five elected), Drs. G. H. Haumesser, Shumway; J. N. Mathews, F. Buckmaster, J. H. Walker, and F. W. Goodell, Effingham.

DR. H. TAPHORN, Secretary.

FULTON COUNTY.

The fiftieth meeting of the Fulton County Medical Society was held in the Churchill House, at Canton, December 15, 1909, and was called to order by President Robb. The minutes were read and approved after including Dr. Harris among those receiving thanks for taking part in the annual meeting. Dr. Standard was elected to membership. Dr. Shallenberger moved that Dr. Ray be allowed $10 on account of an accident to his automobile during the canvass of the county preceding the annual meeting. Carried. Dr. Shallenberger moved that the secretary be allowed $50 for his service to the October, 1910, meeting. Carried. Dr. Simmons presented a paper on "Pneumonia," Dr. Rogers one on "Thyroglossal Fistula," and Dr. Coleman one on "Gall Bladder Infection." The papers were freely discussed. Those present were Drs. Robb, Coleman, Rogers, Shallenberger, Standard, Chapin, Grimes, Allison, Blackburn, Simmons and Ray. The following program was adopted for the May meeting: "Salicylic Acid as a Food Preservative," Dr. P. H. Stoops; "Legislative Injustice and Political Apathy a Weakening Factor in Medical Organization," Dr. H. C. Mitchel, Carbondale; "Active and Passive Immunity," Dr. C. N. Allison; "Our Protective Feature," Dr. H. N. Moyer, Chicago.

D. S. RAY, Secretary.

M'LEAN COUNTY.

The December, 1909, meeting of the McLean County Medical Society was addressed by Dr. Watson Gailey on "The More Prevalent Eye and Ear Diseases." The author of this paper called attention to "suppurative conjunctivitis," urging Credé's method of prophylaxis in every case, both rich and poor. Dr. Taylor spoke on "Some External Operations Connected with the Eye," in which he advocated the use of the electrocautery point in certain diseases of the lid and of the nasal duct. Drs. C. P. Wikoff and F. P. Boyd of Bloomington and Dr. W. G. DuFore of Chenoa were elected to membership.

MASON COUNTY.

At a meeting of the Mason County Medical Society, at Havana, Ill., Jan. 3, 1910, the following officers were elected for the year: Dr. A. F. Burnham, Mason City, president; Dr. E. W. Paul, Forest City, vice-president; Dr. F. F. Garrison, Havana, secretary-treasurer, Dr. H. O. Rogier, Mason City, delegate. Dr. C. H. Steubenrauch of Havana was voted in as a member of the society. The next meeting will be held April 4 at Mason City.

F. F. Garrison, M.D., Secretary.

MORGAN COUNTY.

The annual meeting was held in Jacksonville, Dec. 9, 1909, at which the report of the outgoing officers was read and the following were elected to serve the society the coming year: President, Dr. Grace Dewey; vice-president, Dr. F. A. Norris; treasurer, Dr. A. L. Adams; secretary, Dr. George Stacy; librarian, Dr. Carl E. Black; censor for three years, Dr. E. F. Baker; delegate to state society, Dr. E. L. Crouch; alternate, Dr. Josephine Milligan.

George Stacy, M.D., Secretary.

The society held its first meeting of the new year in its rooms at the Public Library, with Dr. Grace Dewey presiding. Members present: Drs. Bradley, Dewey, Crouch, Gailey, Hardesty, Milligan, Ogram, Stacy and Woltman. Dr. T. O. Hardesty, the County Physician, brought up the question as to the desirability of reporting cases of tuberculosis so that a map might be made of the cases existing in the city. This was discussed by the members present but no definite action as regards this particular disease was taken; however, the appointment of a committee was authorized whose duties it will be to formulate the society's ideas along the line of prevention of contagious diseases in general, which committee is to report at the February meeting.

Dr. George Stacy presented a report of a case of acute lymphatic leukemia of about forty days' duration in a girl aged 4½ years, which showed a greatly enlarged liver, spleen less enlarged, involvement of lymphatic glands of cervical region, tumefactions in both cheeks and others scattered about the head. Necrosis was present in the mouth with hemorrhagic discharge and alveolar infection, exophthalmos, marked; an anemia, pernicious in type, existed, together with a low grade leucocytosis, 17,920. Differentially there was a relative increase in the small lymphocytes and the leucoblasts or large lymphocytes. Red cells were distorted and megaloblasts, megalocytes, and normocytes were present. There was no hematuria.

Treatment was of no avail. Fowler's solution in increasing doses, as recommended by von Leube, was given; also elixir of iron, quinin and strychnia as a tonic. Bowels were kept open with phenolphthalein and salt solution enemata. After running the acute course as mentioned above, patient died. No autopsy permission was granted. This case seems to fall with those in which we have all the features of an acute leukemic process except the lymphemia.

Following the case report, a general outline of acute lymphatic leukemia was given and the close relation of acute leukemia to sarcoma, Hodgkin's disease and

chloroma was shown. Recent work done by Emerson, Ottenberg, Auer, Proscher and White and others was referred to. The main hope in this now fatal malady lies, we think, in the recognition of its specific cause. Perhaps most is to be expected from further studies of Auer's bodies, none of which were seen in this case.

Dr. Grace Dewey reported blood findings in eight cases of acute leukemia, all of which presented lymphemia. White cell counts ranged from 89,000 to 665,000. Three cases were the lymphoid type, one being acute.

Dr. B. S. Gailey, speaking from the standpoint of the ophthalmology in acute leukemia, said that the smeary appearance of the disks from diffuse hemorrhage is quite characteristic. When one is able to make out arteries and veins at all, they are difficult to differentiate. Eye changes come late and are at best only confirmatory. Exophthalmos and ecchymosis are common. After discussion and examination of specimens the society adjourned.

In February we expect to hold a joint meeting with the pharmacists of the county to discuss the United States Pharmacopeia, especially as regards the ninth decennial revision.

GEORGE STACY, M.D., Secretary.

SHELBY COUNTY.

The Shelby County Medical Society met Jan. 11, 1910, at Shelbyville. The following officers were elected: Dr. T. Ewing Cherry, Cowden, president; Dr. Theo. Thompson, Shelbyville, vice-president; Dr. Frank P. Auld, Shelbyville, secretary-treasurer. Drs. J. N. Phifer of Stewardson and B. F. Stults of Moweaqua were elected to membership. Dr. F. P. Auld was chosen delegate and Dr. W. J. Eddy alternate to the Danville state meeting. Methods were discussed concerning the education of the public on hygiene and public sanitation, and it was decided that steps be taken at a future date to hold a public meeting, inviting the public in general to attend. It was decided to hold the next meeting on April 5, 1910, for which a program would be arranged by the program committee.

F. P. AULD, Secretary.

TAZEWELL COUNTY.

The following resolutions were adopted by the Tazewell County Medical Society, Jan. 11, 1910:

WHEREAS, It is often desirable that the physician know something in regard to the general disposition of particular individuals as to the payment of medical fees, and,

WHEREAS, It is not always advisable for the physician to make direct inquiries concerning the same, and,

WHEREAS, Each physician would be greatly benefited by receiving credit reports on otherwise unknown persons, therefore be it

Resolved, That the Tazewell County Medical Society do hereby establish a credit reporting department, and also

Resolved, That it shall be the duty of the secretary of the society, on the request of any member in good standing, to ascertain as nearly as possible the credit standing of the person asked about, with those with whom he has previously transacted business, and to report the same to the member making inquiry; also

Resolved, That it shall be the duty of each member of the society, when asked by the secretary, to make a true and honest report of his credit rating of the person being investigated. It shall also be the duty of the physician asking the report to give full name, occupation, present and past address of the person, and, if possible, the name and address of physicians previously consulted; furthermore, be it

Resolved, That the secretary shall keep in a book, especially used for that purpose, a record of the reports received, which shall be open to any member of the society at any time.

Resolved also, That this credit service shall be free to members (in good standing) of the T. C. M. S., the expense of getting the reports being taken from the society treasury, but that non-members shall pay in advance 25 cents for each report asked for; finally

Resolved, That reciprocal relations may be established with other credit rating societies, associations and companies for the mutual exchange of services.

F. C. GALE, Secretary.

UNION COUNTY.

The Union County Medical Society met in the Chemical Laboratory, Benton Hall, Union Academy, Anna, Ill., Wednesday, Dec. 29, 1909, at 2 p. m. The following members were present: Drs. J. J. Lence, E. V. Hale, Karl Sanders, A. J. Lyerle, S. C. Martin, Eugene Cohn, J. C. Stewart and W. G. Morrow. Dr. Karl Sanders read a paper on "The Relation of One Physician to Another." Rev. Craighead, pastor of the First Presbyterian Church of Anna, read a paper on "Religion and Medicine." The following officers were elected for the ensuing year: Dr. T. J. Rich, Anna, president; Dr. Eugene Cohn, Anna, vice-president; Dr. E. V. Hale, Anna, secretary-treasurer; delegate, Dr. Eugene Cohn; alternate, Dr. J. I. Hale; censors, Drs. L. J. May, T. Lee Agnew and A. J. Lyerle. On motion, Rev. Craighead's paper was ordered sent to the ILLINOIS MEDICAL JOURNAL for publication.

Adjourned.

E. V. HALE, Secretary.

WESTERN ILLINOIS DISTRICT MEDICAL SOCIETY.

The annual meeting of the Western Illinois District Medical Society was held at Quincy, Oct. 29, 1909, at the Elks Club Rooms. The following officers were elected for the ensuing year: President, J. H. Rice, M.D., Quincy; vice-presidents, Waldo Fisher, M.D., Alton, and J. G. Franken, M.D., Chandlerville; secretary-treasurer, W. P. Duncan, M.D., Jacksonville; board of censors, R. J. Christie, M.D., Quincy; L. J. Harvey, M.D., Griggsville, and L. H. A. Nickerson, M.D., Quincy.

The following excellent program was carried out: "Evolution in Borderland Cases," J. L. Wiggins, East St. Louis; "Should the Country Practitioner Specialize? In What and Why?" J. G. Franken, M.D., Chandlerville; "Treatment of Compound Fractures," W. W. Williams, M.D., Quincy; "Treatment of Fracture of Femur with Exhibition of an Original Splint," W. E. Gilliland, M.D., Coatsburg; "Fractures of the Hip," Clifford U. Collins, M.D., Peoria; "Opening the Discussion on Fractures," C. E. Black, M.D., Jacksonville; "Suburban Major Surgery Without Hospital or Trained Nurse; Report of Cases," J. Estill Miller, M.D., Pittsfield; "Traumatism as a Factor in the Production of Insanity," R. T. Hinton, M.D., Jacksonville; "Clinical Report—Neuritis and Complications," L. J. Harvey, M.D., Griggsville. There was a good attendance and much interest. The next meeting will be held at Alton in 1910.

SHOULD THE GENERAL PRACTITIONER SPECIALIZE? IN WHAT AND WHY?

J. G. FRANKEN, M.D., CHANDLERVILLE, ILL.

The pyramid as an architectural structure is the safest of all edifices, for it is built on a broad foundation. Any knowledge built like a pyramid on such a base is fundamental, for a superstructure cannot topple. The science of medicine must ever be based upon such a foundation. General medicine precedes specialism. The specialist who is the best "generalist" is the safest in his chosen "specialty."

Of such the country is replenished to satiety, especially where environments for an open field are inviting. Naturally the larger cities offer the greater inducements. This specializing is partly from choice, partly from necessity. As

no one can have thorough knowledge in all "isms" and "ologies," so the *vox populi* calls on the fittest for special labor. This is right, because these are the natural sequences of existing conditions.

But with a surfeit of specialists in the larger cities the question arises, how to furnish them with material for the chosen work? They look to the general practitioner for material.

Is the general practitioner less equipped by nature, by education, ambition or natural tendencies? Should he be the source of supplies, the undeveloped mine, an ever yielding resource to the specialist? Yes, and no.

For several years the medical journals have been surcharged with views expressed pertaining to the relation of general practitioner to the specialist, fees paid and fees divided. Does the specialist need the assistance of the general practitioner any more than the general practioner needs the specialist?

I am a general practitioner in a small town, and attend to the work under my care. Am I dependent on the specialist? Absolutely I must have his help. Do I consult him for my financial gain? No. For his special pecuniary benefit? Not if I can help it. But solely to benefit the health and condition of the patient entrusted to my care. The patient is mine, to treat, to cure if I can, to ameliorate his sufferings if I cannot cure. Is that all? No. It is my duty to procure aid when I can to restore him to health and happiness. When my means are exhausted I seek help elsewhere.

We are here confronted with the query, what constitutes a specialist? Am I a specialist in such a case? I may be and should be. I should be at least a theoretical specialist, and I seek the help of a practical specialist.

As a homely illustration: I drive horses, I know my horses must be shod so they can travel safely and well and preserve their feet. Can I shoe them? Theoretically I can, but the practical horseshoer does the work, sometimes aided by my suggestions and instructions.

My patient has been and is under my care; I know him, I have studied him, have diagnosed his case; I know what must be done for him. Theoretically I am a specialist. I consult a practical specialist, I give him the history of the patient, which he could ascertain from the patient only by long and painstaking examination, and then not completely without a clinical history of the case. He, by reason of special preparation, special education, special armamentaria for chosen work, in which he has perfected himself, is my help for my patient.

What about compensation? Each receives compensation for work done. If the patient remains in my care for after treatment, the special work was an interstice only in the course of ailment and the specialist receives pay according to skill shown and help rendered, and is foreign to my services.

Should, however, the patient remain under the specialist's care until restoration of health, or until death, as the case may be, my labor ends when I put the patient under his care, because I have done all I could. I have given him my care and my best advice and charged him for the same. I am not entitled to further fees where I render no service, and neither patient nor specialist is under pecuniary obligation to me.

Do I voluntarily and willingly give up my work and turn it over to a specialist? Not if I can help myself. I must learn to specialize. I must know in what particular lines of work I must depend on myself, necessitated occasionally, however, to call consultations with my confreres. In what lines of work I must specialize theoretically and seek the aid of a practical specialist. I must know what to cull out of my practice and send to the specialist, who is better equipped by special preparation and with special armamentaria, who can help the patient where I cannot.

In the category of diseases where I must depend on myself and where I must specialize, are the acute, infectious, contagious and exanthematous diseases of both old and young. Although self-limited, these diseases need strict care and attention. Medicine and nursing will frequently turn the tide and save the patient from an untimely death. The so-called bowel complaints of little children during their first and second summers, acute and subacute, milk infection, aug-

mented by hot weather and unhygienic surroundings, call forth special effort, training and labor of the general practitioner. I must of necessity be my own specialist. More than that: here lies the rise or fall of my success in the community where I have thrown my lot and where I depend on my work for my livelihood. If I can save the child I have the family my firm support in furtherance of my practice. Here also will show my social and natural traits, besides my special skill, if I can gain the confidence and love of the child. You cannot deceive a child, the lines written by the poet, "I do not like thee, Dr. Fell; the reason why I cannot tell, but this I know so very well, I do not like thee, Dr. Fell," have more truth than poetry in them. My soothing, encouraging influence on the child has its beneficial influence and belongs to the treatment.

Next to children's diseases comes obstetrics. I must of necessity thoroughly understand my specialty. Child-birth admits of no time for delay or consultation. Luckily, when all conditions are normal, any midwife or old "granny" may succeed in helping the youngster discover America, for nature is lavish in asserting herself and restoring to normal. But when emergencies arise, when placenta prævia presents itself, when albuminuria has caused eclampsia, when presentation is abnormal, when a pelvis is contracted, when podalic version has to be resorted to, when a prolapsed cord threatens the life of the child, when forceps have to be applied, when an anesthetic has to be given, when a cyanotic baby has to be resuscitated, when post-partum hemorrhage blanches the face of the mother and death seems imminent, when an adherent placenta has to be removed, when hour-glass contraction shows itself, when an atonic uterus fails to contract, or threatens subinvolution, when lacerations of cervix uteri or perineum are unavoidable and must be repaired, when shock or prolonged labor exhaust vitality, I must know what to do; I am the specialist.

In the field of surgery I must specialize; fractures and dislocations are best reduced before the four cardinal symptoms of inflammation; dolor, calor, rubor, and tumor claim too much attention. Thorough knowledge of anatomy plus mechanical skill will enable us to reduce a dislocation before much swelling obscures diagnosis. Familiarity with mechanical appliances, after the contour of a broken limb has been restored to normal, will aid in making my patient comfortable. Nor must I forget my knowledge of administering an anesthetic to facilitate reduction of fractures or dislocations. In minor surgery, cuts, bruises, contusions, lacerations, insignificant in the eye of a specialist and in themselves of little consequence, are, however, of value to us, if the patient is made comfortable soon after the accident causing same occurs.

There is another class of patients which should remain under my care, and where a specialist, when these patients come to him, could even more specialize, and that is the chronic growler, the one who is always ailing, ever seeking new cures, never satisfied with any one, who thinks he is a martyr, a scapegoat of all sins of omission and commission. Here is where our friends, the enemy, the quack, the faker, the advertising so-called specialist, has all of us at a disadvantage. He is, in a sense, a specialist. He has studied P. T. Barnum's motto: "The American people like to be humbugged," and he does it. He is a specialist in suggestive therapeutics. It is not for us to emulate his modus operandi, but from him we can learn that suggestive therapeutics, applied in a legitimate way, will undoubtedly be of value to us. This specialty is so broad, so far reaching, so comprehensive, that the merest allusion to it here might suggest that we should all generalize in it before we make any attempt at specialization.

The line of work in which I must be the theoretical specialist, and where I must seek the help of the practical specialist, is not so circumscribed, for it may include some of the diseases mentioned where extraordinary skill and mental acumen are needed. But all purely surgical cases of the major type must be referred to the specialist, who has made surgery his life work. After my diagnosis, corroborated by the surgeon, the patient must, if possible, be removed to a well equipped hospital. I regard it as almost criminal to undertake a major surgical operation outside of a hospital, except in emergency cases, where sound judgment may see a possible preservation of life, as against a positive death by

delay. It does not speak against my skill as a diagnostician or prognostician to refer this class of cases to a specialist surgeon. I render my patient a most decidedly valuable service by doing so. I, as a theoretical specialist, prove my worth by pursuing the right course. This field of work, from plainly surgical cases to borderline cases, is very extensive, and gives me ample scope for specializing in theoretical surgery.

There is a class of cases that come to the general practitioner which do not require any special skill or great mental acumen to diagnose, which any ordinary doctor of medicine diagnoses readily, but which require, nevertheless, special treatment by specialists who have made themselves proficient by extra study and by procuring special armamentaria, and which the general practitioner should cull out from his work. He has neither the time nor the skill and is not expected to render them aid except in emergencies, and then only as first aid to the injured. In this category come eye, ear, nose and throat work. I may treat a simple conjunctivitis, or possibly a trachoma, I may remove some polypi, cut away a faucial of Luschka's tonsil, or with a Gottstein curette clear away some adenoids, but I think it safer for the patient to let the specialist attend to this kind of work, and referring these cases to him will not lose me any prestige. I may stop the earache, remove a foreign body from eye, ear or nose, but when delicate work on these organs has to be undertaken, let the eye specialist restore sight by fitting spectacles or removing cataracts; let the nose specialist straighten a deviated septum or drain ethmoid cells; let the ear specialist restore hearing by puncturing a tympanum or doing a mastoid operation. I have neither time nor practical knowledge to infringe on their domain.

One vast class of patients come under any or all of these heads. (1) When I may specialize; (2) when I may theoretically specialize, or (3) when I may refer any or all to a specialist; this is the mental and nervous type of patient. Specialization of this type depends to a great extent upon the knowledge to classify them; to know what kind to keep at home and what class to refer to private or public institutions. When mental aberration is so pronounced that a jury as prescribed by law finds no difficulty in committing the patient to an institution for the care of such unfortunates, the general practitioner is absolved from all further care; but often we have to deal with patients who by force of circumstances and family ties are kept at home. These are frequently our trying cases. In a rural community you may find an imbecile child, a halfwitted boy, a hysterical girl, a paretic man, paranoiac woman, an old man or woman afflicted with senile dementia; many or all possibly subjects for public asylums. But they show no maniacal, suicidal or homicidal tendencies, hence their immediate relatives prefer to keep them at home, "do" for them what they can, and the family physician has a condition and not a theory confronting him. The family physician often wishes for more strictly enforced laws pertaining to the public care of these patients; but he is expected to prescribe for them, aid them if he can, ameliorate their luckless condition, and necessity calls forth latent abilities; he sees that special knowledge and special training prove to him that much good may be accomplished.

The field of labor for the general practitioner is too large to admit of special specializing, but I have tried to show that he can find application of thorough knowledge of at least a few places of applied medicine, and that it behooves him to remain wide awake, for specialization is, after all, greater proficiency in his work. He finds that as yet he is not superfluous nor a non-essential factor in his great work and noble profession.

FRACTURED FEMUR

W. E. Gilliland, M.D., Coatsburg, Ill.

Mr. President and members of the Western Illinois District Medical Society: I have been requested by the members of the Adams County Medical Society to present to you my method of treating fractured femur and exhibit to you an apparatus which I have devised for that purpose.

Every one who has treated a fractured femur has found out that the tension and spasmodic action of the powerful muscles of the thigh which causes the ends of the bones to pass or overlap each other, producing shortening and deformity, is the resistance which they are sure to meet and which they are required to overcome.

The treatment of these fractures is best accomplished by position, extension and counter extension and fixation.

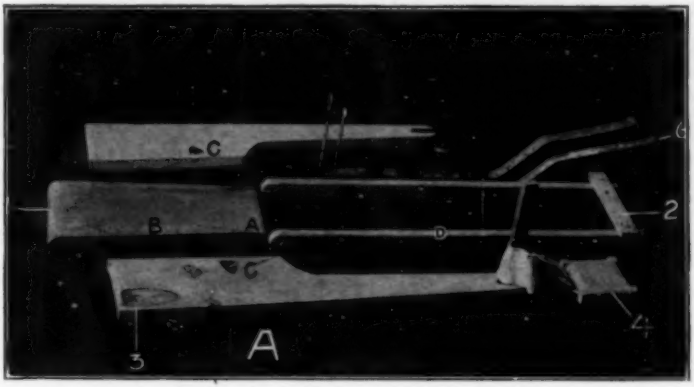


Figure A.

The apparatus which I have devised and which I have used for a number of years employs all these principles in the most perfect manner, in a manner calculated to get all the good out of them that is in them.

The apparatus which I will show is composed of a body piece, a pair of legs united by a cross piece near the foot, a pair of arms, an equalizer and a cross bar

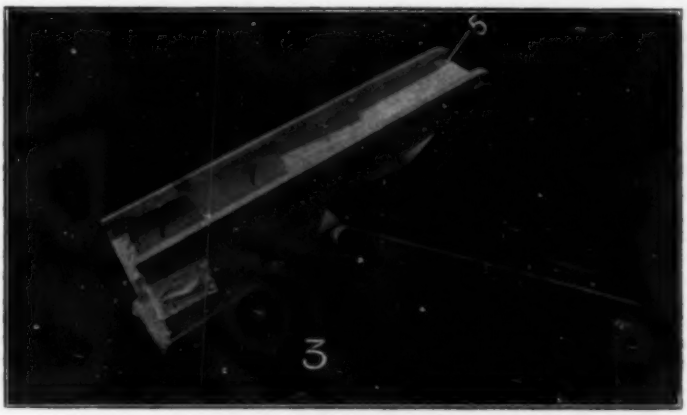


Figure B.

all made of wood. Two brace rods with hooks on ends made of heavy wire, several wood-screws, four squares of adhesive plaster with tails of strong cotton bandage firmly sewed to them, and some pieces of common roller bandages, adapted in length and width to the size of your patient. These comprise the outfit.

The splint or body should be just long enough to reach from the tuber ischium to the bend of the knee and about two inches wider than the transverse diameter

of the thigh. The ends are rounded off to prevent sharp corners from cutting into the flesh. The legs are fastened on either side at *a* with wood screws, leaving them loose enough to form a hinge. At *b* a screw is inserted on which the brace rods are to be hooked.

The two legs united with a cross bar at the lower end are represented at No. 2. They are united to the body piece at *a*, with wood-screws inserted upon which the brace rods are hooked. From one of these legs to the other pieces of bandage are extended, upon which rests the leg below the knee.

No. 3 is one of the arms made of wood shaped as shown in the cut. The upper end should be nearly as wide as the antero-posterior diameter of the thigh. They should be about twice as long as the body splint. They are fastened to the upper surface of the body piece with wood screws inserted in the gain at *c*. They should just touch the sides of the thigh. They also hold the cross bar or brail No. 5 in place, at their distal ends. These arms are concerned chiefly in making extension and counter extension. No. 4 is the equalizer and single-tree. It plays freely between the arms beyond the knee. It should be as long as the transverse diameter of the knee, and wide enough to keep the tails of the lower adhesive plaqques distended.

No. 5 is the brail or cross bar and is held in place by the slots in the end of the arms. To it is attached the strong elastic web that contributes the elasticity to our extension.

The wire brace rods with hooks on them lie between No. 2. They extend from the screw on the outside of the body piece at *b* and extend to the screw on the inner surface of the leg at *d*. They hold the frame in a double inclined plane position.

No. 6 is a representation of a steel arm that might well be substituted for the wooden arms numbered three. They are intended to be used in compound fractures where it is necessary to have access to the limb for purpose of applying dressing.

No. 7 is the squares of adhesive plaster with tails attached. B is a representation of the frame of the apparatus unoccupied.

We will want a number of pieces of common roller bandage. They should be 2½ inches wide, and long enough to go once and three-fifths around the limb. Have them long enough and you may cut them off as you apply them. Draw a line down the center of the body splint, and fasten this many-tailed bandage to it with tacks, commencing at the upper end, and allowing each plica to overlap its fellow at least one-half. Before placing the leg on the splint cover the heads of the tacks with a layer of cotton or a strip of bandage. Fasten the legs to the body as above described, and fasten some pieces of bandage across their upper surface and fasten each on the outside of the leg. This may be done also with tacks.

While you elevate the limb, have an assistant place the splint under it, pushing it up until the upper end impinges on the tuber ischium. Now the limb lies full length on the splint. Take hold of the splint opposite the knee and raise it up until the rods can be hooked on the screws. Now you have the leg on a double inclined plane. Let your assistant take hold of the leg below the knee with one hand and the ankle with the other and make firm traction, while you ascertain if the fragments are in apposition. Being satisfied, you are ready to apply your many-tailed bandage. Take hold of the initial end with your right hand and turn it neatly across to the opposite side of the thigh. Then take the second end in your left hand and turn it over the thigh in the opposite direction covering in the initial end, and thus proceed until all the ends are employed; then fasten with a pin. In applying this bandage be careful not to cover in the tails of your adhesive squares. It will surprise you to see how neatly this bandage embraces the limb, how firmly it holds your adhesives and how perfectly it fixes and immobilizes the whole limb. There is not a spot anywhere that can be chafed by friction or injured by pressure. While this is being done let your assistant keep up his traction.

Now we are ready for the arms. Observe where the *gains* are cut, and place the proper ones on each side of the limb just close enough to touch the limb gently, and just as high up as they can go without impinging on the perineum. Now fasten them to the body piece with a screw inserted in the hole in the *gain* on the outside of the arm. Now place the cross piece in the slots at the distal ends of the arms. Now bring the tails of the upper adhesives around the shoulders and fasten them on the outside of the arm as shown in the cut B. Now fasten the tails of the lower adhesives firmly to the equalizer No. 4, then fasten the elastic web around the cross piece No. 5, pass it around the equalizer, making it as tight as may be thought sufficient. One thing more, loosen one end of the bandages that cross from one leg to the other and adjust them to the contour of the calf, and be careful not to put one under the heel. You all know how the heel is given to kicking when subject to pressure.

Now I wish to call your attention to the mechanism of this splint, how perfectly it accomplishes its object. Remember, the principles to be employed are extension and counter extension and fixation or immobilization. Notice that the adhesive placques get a firm hold on the thigh above and below the site of fracture. The ones above the fracture, when turned around the shoulder of the arm and fastened there become the basis or counter point of our extension. Those below the fracture, when fastened to the equalizer and by the elastic web to the cross bar, become the true extensors. This extension and counter extension, being directly in the line of the axis of the bone, is the most perfect attainable. By the use of the elastic extension the spasm of the powerful muscles is worn out in the shortest possible time, and there is no danger of complete relaxation at any time.

I now want to call your attention to the double incline plane. I have already stated that position is one of the principles employed in the treatment of these fractures. In some of the older methods of treating fractured femur, a common deformity was an everted or an inverted foot, caused by a failure of the apparatus to prevent a rolling of the foot either outward or inward, and twisting the fragments on each other. A sore heel contributes to this effect, and if allowed to go on until the bones are united the deformity becomes permanent.

The double inclined plane obviates this difficulty completely. But the double inclined plane performs another important office. It gives your patient a most comfortable position. You all know how unsatisfactory the treatment of any fracture is when your patient is not comfortable. After a few days your patient will spend his waking hours in a sitting or half reclining position. If the fragments are properly coaptated he will have no pain, and will enjoy himself in reading, writing, sewing, etc., and will be able to eat his meals in an upright position, and by placing both hands under him on the bed he will be able to move from one side of the bed to the other or lift himself on the bed-pan, etc.

After three or four days, when the spasm of the muscles has worn off, there is no danger in undoing the bandage and examining the limb thoroughly or giving it a sponge bath. This gives you an opportunity of ascertaining whether or not the fragments are accurately adjusted. As soon as I am satisfied that all is right I am in the habit of giving the bandage a heavy coat of starch, after which it seldom needs any attention until the end of the treatment. While I have had no experience with it, know of no reason why this apparatus, with the steel arms instead of the wooden ones, would not be as good in all respects for treating compound fractures of the thigh, say a bullet wound or a wound where the bones had protruded through the integument. Indeed, if I were making a new splint and had access to a blacksmith I would use the steel arms for all kinds of fractures.

There is one other quality in this apparatus I would call your attention to, it is the best adapted of anything I have ever seen for transporting a patient with a broken femur. As soon as the starch is dry you can start with him. Place him on a cot and put him in a spring-wagon and haul him to the depot. Then, if you have but a short distance to go, set cot and all into a baggage car, and he will go all right. If you have some distance to go avail yourself of the lower berth in a sleeper, and, with a nurse to attend to his wants, you can take him to the end of the road, and that, too, without danger or suffering.

The history of this splint is somewhat interesting and will illustrate some of its good points. It is the result of a process of evolution. My first case of fractured femur was in a girl aged 11 years. The fracture was near the middle and I had no difficulty in determining that there were three fragments. I put it on a well constructed Liston long splint. It was July, and the temperature around the hundred mark. On the third day my patient was in so much misery that I was compelled to take it off. The skin was off wherever the splint touched. This set me to thinking. I then stretched the limb out on a hard mattress and put a weight to the foot, and went away to do some more thinking. At my next visit I found the foot laying over on its outer side. I then put her limb on a double inclined plane and hitched my weight to the knee and elevated the pulley in line with the bone. This looked pretty good to me. Here is where I got the first idea of the value of the double inclined plane. She was a restless little mortal and I soon had to fasten her body to the bed frame, but she was comfortable. I soon saw that her movements, to find a comfortable position, produced a tendency in the limb to bow outward at the site of the fracture. I corrected this by putting on a plaster of Paris splint applied to the outer side of the limb. I got a perfect result, but here is where the idea of fastening the limb to the posterior splint was born.

The next case was a boy aged 17 years, with a simple fracture a little above the middle. I immediately put the limb on the double inclined plane and fastened it with the many-tailed bandage to the posterior splint. While conjuring up a support for my pulley the idea of putting arms on the splint occurred to me. At my next visit I took a pair along with me. Without taking the limb off of the splint I opened it up, applied the patches of adhesive placques, made an equalizer, took one of his new suspenders for an elastic web, and my splint was passed the stage of incubation. It was a reality, a working entity.

I will now give you another case in which, while the same principles were employed, the apparatus had to be considerably modified, and illustrates the fact that the surgeon must be full of resources. An old man at the Adams County Almshouse was found one morning in his room with the femur broken just above the condyles, and the lower fragment was split in two. Here I had a man 76 years old, insane and a lifelong epileptic. It occurred to me as a tough problem. I made a box and cut the ends down to form the double inclined plane, filled it with stones so as to make it heavy, nailed my posterior splint to one end of it and covered the lower end with a board, also with a hole cut in it to accommodate the heel. I put the limb on this box and fastened it from the heel to the perineum with a many-tailed bandage. I had no difficulty in adjusting the fragments, and with a couple of strips of adhesive plaster was able to hold them so. In six weeks I had a bony union with but little deformity and a movable joint.

Now, as to the result of my use of this splint, I have to say that I have had five cases without a failure. Five cases with a perfect result in each case, so perfect that I doubt the ability of any one of you to determine which limb was broken. Five cases, of course, are not many, but five cases without the slightest deformity is a good record, so far as it goes.

One of them was a case of non-united fracture of several weeks standing. On March 28, 1905, G. C., a boy aged about 13 years, received a fracture of the femur about the middle. He fell into the hands of my neighbor, Dr. L., who put it on a Liston long splint. This proved unsatisfactory and he resorted to weights and pulleys. On April 4 following Grover G. received a very similar fracture of the femur which fell into my hands. I put it up on my own compound splint. It progressed nicely without a hitch and on the 28th day I took it out. The union was perfect, and without so much of a blemish as a provisional callus. As he wished to go to school, as a safeguard, I put a plaster of Paris splint on the outer half of the limb, and fastened it on with adhesive strips. On the thirty-second day after the accident he went to school, on crutches of course. When my neighbor, Dr. L., saw this he came and asked me what I had done with the splint I had used on Grover. I asked him if he had another fracture so soon. He replied that he had a non-united fracture. When I got it down for him he asked me to go

and help put it on, which I did. The poor boy was laying there with both a Liston splint and a set of weights and pulleys on his broken limb. He was reduced to skin and bone and the leg was as limp as if it were fastened on with a string. I put it up very carefully, and it was never opened until union was perfect, which consummation was found to have been reached on the twenty-ninth day after the splint was applied. Even under all these untoward circumstances we got a perfect result. You would now have difficulty in finding which leg was broken.

My work with this splint so far has been extremely satisfactory. The comfort of my patients, which adds who can tell how much to these favorable results, is worthy of your attention. Take a nervous, restless person, a child, for instance, and it is utterly impossible to keep them still enough for bones to unite while they are suffering pain. Then to observe the happy result of your work furnishes you occasion for self-congratulation. Think of it, no limp, no overlap, no shortening, no kick, no grumble, no refusal to pay, no suit for malpractice, no—nothing but showers of blessings.

MAJOR SUBURBAN SURGERY, WITHOUT HOSPITAL OR TRAINED NURSE.

J. Estill Miller, M.D., Pittsfield, Ill.

The theme of this paper was suggested to me by Dr. Howard Kelly, with whom I was talking some time ago, and incidently mentioned an experience similar to those which are to follow. He seemed greatly surprised, and requested me to write it up, so you may blame him for the burden I am placing upon you.

Until recently Pike county has not had the advantage and conveniences of modern hospital facilities, nor have we had trained nurses to help us over the rough places in sickness and surgery. Therefore, our emergency surgery was done at the patient's home, frequently with but little preparation of operating room or patient, and amid the most unhygienic surroundings. The results I have had were at first surprising to me, but as I became more familiar with this work, modifying my technique as the occasion required, I was surprised when I did *not* get good results. I regard the urban surgeon's work as comparatively easy. All the facilities of a great hospital are at his disposal. He does not have the worry of making every preparation himself, even from the smallest detail. He has not the nervous strain of watching every man and woman during the process of preparation to prevent them breaking the technique, nor is he fatigued by a long country drive. His patients are frequently from adjoining towns or country, and if they are able to make the trip they are in good condition for operation.

Notwithstanding all these advantages, there continues a certain percentage of infections in clean cases operated on in the city hospitals. I often wonder if this is not caused by air infection. We know that city air is full of pathogenic organisms which are stirred up from the street by their roller sweepers, and taken up by currents of air. Mr. Lockwood (surgeon to the St. Bartholomew's Hospital) shows that atmospheric bacteria abound most in densely inhabited parts of cities and become fewer in the suburban districts. Dr. M. H. Gordon, in his report to the local government board, found that the air of London, sixty feet above the pavement, contained colon bacilli, and fifteen kinds of staphylococci, streptococci from the mouths and throats of human beings, and also others separated from horse manure. I attribute the wonderful statistics of the Mayos not altogether to their skill—for I have seen many other operators equally dextrous—but to their favorable environment, to their marvelous team work, and to the fact that most of their patients come from a distance. St. Mary's Hospital is situated in the country, one mile from the business part of Rochester, where the air must be very pure. The city surgeon also has an advantage over his country brother in that acutely seriously sick patients who are unable to be moved, and also in whom the operative mortality is greater, usually fall to the lot of the country surgeon, while the patients who are able to be up will frequently go where they can secure hospital facilities.

The ideal condition for operative success is such as exists in a thoroughly equipped hospital in the country or small town. There they are free from the noise of the city, which greatly annoys nervous patients, and they have the quiet and rest which is so essential following serious operations. The pure, wholesome air almost eliminates the danger of air infection.

I hope you will pardon this seeming digression, but the above was written so that you could more fully appreciate the contrast with that which is to follow. In order to understand the difficulties of suburban surgery, it becomes necessary to portray the conditions which maintain in urban surgery.

There are few city surgeons who adequately appreciate the difficulties under which the country surgeon labors. I am sure that if they did they would not look down on us from their pinnacle of fame with the patronizing manner some of them often assume, and they would give more than polite tolerance to the humble experiences we may timidly mention while in conversation with them. This condescension is inexplicable to me. Some country surgeons and physicians have had equal, if not more, advantages than their city brother, and nature may have endowed them with some gray matter and a little dexterity, and they may be obtaining as good, and perhaps better, operative results. The country surgeon does not have as many cases. This affords him the advantage of giving more time to the personal study and diagnosis of his cases. Success in suburban surgery without skilled help depends in a great measure upon the surgeon's ability to attend to every detail, to take infinite pains from the time he enters the home until the operation is over. The least laxity or oversight might result disastrously. The surgeon must form the habit of being Argus-eyed; he must convert himself into a trinity, consisting of trained nurse, skilled assistant, and surgeon. If he relaxes his vigilance, some of his lay assistants are sure to put a dirty thumb over the edge and inside his sterile basin or pans; another may stick a finger into his sterile water, or handle his sterile towels or dressings with unclean hands, or stand over the instrument tray or dressing table, and in many other ways break his technique.

In describing my method of operating in private homes without the usual assistants, I hope you will bear with me when I refer to myself. At the time I receive the call I at once instruct the family to have a good fire in the cook stove, and to put on an ordinary wash boiler full of water, so that it will be boiling by the time I arrive. This serves as a utensil sterilizer, and supplies an abundance of sterile water for cleansing purposes. On arriving at the home I first look the patient over, and decide on the kind of operation to be performed. If he is nervous and excited, I give a hypodermic of morphin and hyoscin. I take my outfit into the kitchen and select two of the most intelligent and handy laymen to wait on me while I am making the preparations, cautioning them in what *not* to do. The family physician is usually present, and renders valuable assistance, but if he is not a young man he must be watched carefully, for he probably has not acquired the aseptic habit. The outfit referred to consists of emergency case, portable sterilizer of Scanland-Morris make, three or four graniteware pans, oval in shape, and made so that one will fit within the other, telescope fashion. I always keep the emergency case packed and ready so that nothing will be overlooked when I receive a hasty call. It contains the instruments, Harrington solution, alcohol, tincture of iodin, drainage tubes, rubber tissues, needles, sterile catgut ligatures, silk-worm gut, and linen; iodoform gauze in aseptic cartons, mask, chloroform and ether, soap, nail brush, adhesive plaster roll, three pairs of gloves, bichlorid tablets, carbolic acid, fountain syringe, bandages, tourniquet, normal saline tablets, forceps for taking utensils from the boiler, and sometimes a Kelly pad. I also keep my sterilizer packed, and bi-sterilized. It contains three gowns, which have mouth covers attached, eight or nine towels, a large jar of sterile gauze sponges, five laparotomy sponges, laparotomy sheet, three caps, nail brushes, also an alcohol stove of large capacity, with folding frame to hold sterilizer. All pans, including those usually strapped under the emergency bag, after being washed, are placed in the wash boiler, also the syringe and gloves are placed in the same boiler. If there is no gasoline stove I start the sterilizer with

the alcohol stove. Then, after the ordinary wash basin has been scrubbed and scalded, I take a preliminary scrub with soap and hot water, changing it several times. I instruct the lay assistants to prepare dining room table, unless I take a portable table with me, which I usually do, for there is nothing so back-breaking as the ordinary dining table used for operation. If it is the extension variety, the leaves are removed, and the patient placed crosswise, with feet resting in a chair. The above assistants remove everybody from the room to be used as operating room, and the floor, whether carpeted or bare, is hastily wiped up with wet cloths. The windows and doors are opened, and fresh air allowed to circulate freely. A stand table or two, if at hand, are brought in, if not obtainable, I use ordinary chair to set sterilizer and instruments on. I next gently scrub the seat of operation, remove sterile towel with sterile forceps, and wring same out of bichlorid solution, and place over seat of operation. The long pans are removed from the boiler, and instruments, needles, drainage tubes, and ligatures placed therein and boiled with other pan inverted over them. Patient is then placed on the table, and the anesthetic started by one of the doctors. I usually let him select the anesthetic with which he is most familiar. The other doctor carefully scrubs up, Harrington solution is poured over his hands and arms, and rubbed in, followed by alcohol. The other pans are removed from the boiler, and gloves placed in one; another is used for bichlorid solution, and a third used for dry sponges. I then have the lay assistant open sterilizer and the doctor hands me the sterilized brush, with which I wash carefully again. Then the gowns, gloves and caps are put on, and the seat of operation gone over slowly with Harrington solution and alcohol, the laparotomy sheet placed over patient, and a couple of towels placed across the body, and the operation proceeds. The sponges and dressings remain in the sterilizer and a few are taken out as required.

This is the method adopted in all cases at private houses, with slight modifications now and then, as circumstances require. I endeavor to do a dry operation, no water or solution used on the patient. The laparotomy sponges only are wrung out of hot sterile salt solution. The wound is dressed with gauze, squeezed nearly dry out of a dark red iodin solution, over which dry sterile gauze is placed. After the operation I usually use a quart of normal salt solution by the rectum (Murphy's method).

I have had 152 major operations at patients' homes, almost all without a trained nurse, and my mortality has been three, all of which were neglected cases of appendicitis with peritonitis. I have had three cases of infection, two of which were stitch-hole abscesses. I will now briefly report a few of my cases from my records:

Willie F., aged 8 years, kicked on the head by a horse, frontal bone fractured. When I saw him a few hours later with his physician, he was unconscious, pulse 68, labored breathing, and occasionally he would claw at the wound. I made hasty preparations, and on opening the wound I found it foul with dry horse manure and dirt from the horse lot. A piece of the frontal bone over two inches in length and an inch wide was driven into the brain, and the membranes were badly lacerated. I removed the large piece of bone and thirteen small pieces. Quite a large quantity of brain substance oozed out. The wound was carefully cleaned, scalp closed, leaving a slight space for drainage, and an antiseptic dressing applied. He regained consciousness in a few hours, and his recovery was uneventful.

Mrs. B., aged 30 years, living in Calhoun county, fifteen miles from my office, mother of six children, youngest six months old. She lived in a log cabin having two rooms, one above the other, with small shed addition which had a dirt floor, and which served as kitchen and dining room. The room I found her in was about 12 by 14, two doors and one window, which was about two feet square. She had been sick about two weeks, first taken with vomiting, and violent pain in the region of the gall-bladder, followed in a few days by chills and a slight fever. A pear-shaped tumor gradually developed in the right hypochondrium, which was movable and tender. No jaundice. Chilly sensations and fever continued, patient rapidly losing strength. Dr. Cromwell of Nebo, who was treating the case, and

I made a diagnosis of obstruction of the cystic duct, and decided something must be done at once to save her life. Imagine the surroundings, source of light, etc., if you can. The husband and one or two of the neighboring women had been nurse, cook and housekeeper. Could worse conditions possibly exist for an abdominal operation? She was unable financially and physically to be moved, so we decided to operate as the only chance. Dr. Wells of Pleasant Hill was sent for to assist. I came prepared to operate, but the nature of the operation was uncertain until I examined the case. While waiting for Dr. Wells I made the preparations above described, which included a short log of wood wrapped in an old quilt, to act as a Lilianthal elevator. On opening the abdomen I found the gall-bladder immensely distended with mucus and pus, and quite a lot of adhesions. On opening it I found several stones, and a large stone was incarcerated in the cystic duct. The walls surrounding it were as thin as paper and seemed ready to give way. I removed this stone, which was seven-eighths of an inch in diameter, and carefully cleaned the gall-bladder, drained through a tube introduced into the cystic duct, and closed the wound. Patient made rapid recovery, healing by first intention.

Albert B., aged 32 years, had had a large inguinal hernia since childhood, truss only partially retaining it. It would come down at times and he would reduce it himself. On the morning of January 21 he slipped on the ice, and it came down larger than ever and resisted all his efforts at reduction. Late in the afternoon he called his family physician, Dr. Swartz of Summer Hill, Ill., who, after several hours' work, decided the hernia was strangulated and 'phoned me to come prepared for immediate operation. It was 10 p. m., and the patient lived seven miles from my office. We had a January thaw a few days previous, and the roads were again frozen and rough, the ruts were deep and the night very dark. I arrived at the bedside at 11:30 p. m., and found the patient with a rupture nearly as large as a child's head. The skin around the penis and scrotum was turning dark and the tumor was tense and painful. The house was an old one, a half story rock structure, into which they had just moved, and had not had time to clean up. The furniture was piled around the only two lower rooms, cobwebs on the walls, and the surroundings far from hygienic. A cook stove had been set up in the room assigned as kitchen and dining room; the only available light was from two small coal-oil lamps. You could scarcely picture more unfavorable environments for a major operation. I went to work, and in one hour and a half was ready for the operation. The patient was placed on a wide sectional dining table. Dr. Gay of Summer Hill gave the anesthetic; Dr. Swartz assisted me. The lights were held by two neighbors. I relieved the constriction at the neck, and removed about two feet of intestine from the sack. The intestine was distended, and almost black in color. Towels were wrung from hot normal salt solution, and placed over them, changing every few minutes. Finally they began to turn from dark to pink, and in a short time were returned to the abdomen. The sack was very adherent, and the muscles adjacent to the hernial opening attenuated from pressure. Closure was made by overlapping and quilting with kangaroo tendon. Perfect recovery without infection, and no tendency to recurrence.

Miss W., aged 20 years, was suddenly taken with typical symptoms of severe attack of appendicitis. I advised immediate operation, which I performed at her home at midnight, assisted by Drs. Shastid and Doss of Pittsfield. Two women held coal oil lamps, which were the only source of light. A gangrenous appendix was removed. Recovery was uneventful; no infection.

Miss M., aged 27 years, acute appendicitis. The patient lived ten miles from my office. I was called by Dr. Cromwell of Nebo at 11 p. m. The surroundings were about similar to those in the preceding case. Operation was performed at 2 a. m. Two coal-oil lamps held by neighbor women furnished the light. Dr. Pollock, also of Nebo, administered the anesthetic. Appendix was post cecal, and you can imagine the difficulties encountered during its removal. The scant light and strong adhesions made the dissection especially trying. Recovery followed without infection.

Mrs. G., aged 30 years; floating kidney; three months pregnant; operated on at her home, with the assistance of Drs. Smith and Doss of Pittsfield. The kidney was delivered in the usual way. A strip of capsule, one inch wide and extending almost the length of the kidney, was reflected from the convex surface, and sewed in the superior angle of the wound to act as suspensory ligament. The remainder of the operation was completed by Edebohls' method. Recovery uneventful; no infection. An eight-pound boy was delivered six months later.

Mr. H., aged 68 years, had suffered for a number of years with discharge from left ear. The ossicles had been removed several years previous. He gave the following history: For several days he had been suffering with an intense headache, situated in the left side of the head, fever, vomiting, and chills. I found on examination tenderness over the left mastoid process, temperature 103½, some delirium, and that the ear which had formerly been discharging had recently ceased. I advised an immediate operation for mastoid disease. With the assistance of Dr. Bechdoldt the mastoid process was opened, the bone found eburnated and thickened. The antrum was finally opened and some pus and cheesy matter was removed with curette. A strip of iodoform gauze was then used, and the patient returned to bed. Recovery was uninterrupted.

The next and last case I wish to report is only partially covered by the subject of this paper, as we had a trained nurse, but no hospital. It proved so interesting to me that I have brought the patient along for your inspection. You can see that he is a man of 68 years, an old soldier. He had been afflicted since childhood with an unsightly angioma of the lower lip, which continued to grow gradually until at the time of removal it was as large as the fist. When he would stoop over it would almost double in size. The tumor involved the left cheek to the angle of the jaw, and encroached on the lumen of the mouth to such an extent that teeth had to be extracted. Still the gums covering the alveolar processes would pinch the tumor while chewing. This constant irritation finally resulted in epitheliomatous degeneration of the labial portion of the growth. This large ulcer caused him great pain, requiring two or three grains of morphin daily to produce relief. Finally he sought relief in surgery. In St. Louis he was refused operation, saying he would almost surely bleed to death. He went to Jacksonville, and was again discouraged. He returned home greatly depressed, had lost over thirty pounds in weight, and was suffering continuously. In this pitiable condition he consulted me and begged for relief. I examined the growth carefully. It was fed by a large number of great blood-vessels, and I told him I would think it over and requested him to return in a few days. He returned at the appointed time, and I explained the danger of operation. He said he would take all chances if there was any hope of relief. There was no place to take him for operation, but I finally secured a small room on the third floor of a hotel and employed a nurse to take care of him. This room was cleaned and put in readiness for the operation. My fellow townsmen, Drs. Shastid and Smith, kindly assisted me in the operation, and Dr. Lacy administered the anesthetic.

I first attempted to remove it by tying the vessels as they were cut. An incision was made from the right corner of the mouth down to the angle of the chin, then approaching the growth across the lower border of the chin, but the vessels were so large and numerous in the region of the growth that I had to abandon the method. I then made an incision over the carotid artery, low in the neck, its sheath was opened, and a ligature passed around the vessel. As I did not have Crile's clamp, I selected an elastic hemostat, put rubber tubing on same, and made traction on the ligature, which separated the vessel from its neighbors, and gently applied the clamp, closing it just enough to stop the circulation. This gave me an almost bloodless field in removing the tumor. Each vessel was securely tied, a portion of the left cheek removed, going just below the salivary duct. A slight band of healthy mucous membrane was left at the lower border of the gums with which to line the new lip. After the growth was removed, a collar incision was made about two and one-half inches below the lower border of the wound. This collar was dissected loose from underlying tissues, and left attached at both ends, making a sling. The head was bent forward and the sling placed

over the chin and attached by two silkworm-gut sutures to periosteum, and the mucous membrane sewed to the upper border to form the new lip. The angle of the mouth was closed, the suture line extending backward to close opening in cheek. The space from which the sling was removed was now closed by drawing the loose skin of the neck upward.

The operation being completed, I released the carotid, leaving the ligature around it, but untied. The artery, which was atheromatous, had been clamped about two hours, and in a man of his age I felt greatly concerned as to the condition of the brain and intima. After the clamp was removed the vessel remained white for some time, and I began to feel doubtful as to the circulation being restored, but it pinked up, and the face assumed its normal color. The wound was closed except at a point where the end of the ligature came through. The nurse was then instructed to tie it at once should the ligatures on the vessels in the wound fail to hold and active hemorrhage set up from straining at vomiting or other causes. There was no hemorrhage, and the ligature was removed from around the carotid twenty-four hours later. Convalescence was uneventful, except during the first four days and nights he had a most persistent attack of hiccough.

Some of the city surgeons would lead us to believe that clean, successful major surgery could not be done in patient's home, except at imminent danger to life. I am convinced that this is not true; that while hospital trained nurses and assistants are great conveniences, yet they are not absolutely essential for good work and good results. It is not the purpose of this paper to inveigh against hospitals and trained assistants, for I now have these conveniences myself, and I find that I can do my work much easier and without the fatigue and worry incident to private home work.

TRAUMATISM AS A FACTOR IN THE PRODUCTION OF INSANITY.

R. T. Hinton, M.D., Jacksonville, Ill.

There is no one cause for insanity. Investigators recognize the importance of both predisposing and exciting causes, and classify trauma as a cause belonging to the former group. A few, however, have recognized a psychosis resulting directly from an injury, considering the same to be a post-traumatic dementia. It may be stated, however, that trauma is a predisposing factor, contributing its part in the production of the psychosis by interfering or preventing the brain from asserting its normal recuperative or resistive properties.

In considering the relation between injuries of the brain and insanity, I wish to exclude the following groups of cases: 1. Intrauterine or parturition injuries resulting in the defective development of the individual. 2. Post-traumatic deliria, either transitory or followed by death from exhaustion. 3. Cases in which the injury sustained was merely a coincidence and was not really a causative factor in the production of the psychosis. 4. Post-traumatic epilepsy. 5. Psychoses following operations. 6. Traumatic hypochondriasis.

While my subject includes injuries as a cause of insanity, I shall limit my discussion for the most part to injuries of the head, referring but briefly to other injuries later. There are two mechanisms by which the cerebral cortex may be severely injured. 1. The direct, a blow upon the vault or striking the head against an unyielding substance. This is the more common cause. 2. The indirect, the force being transmitted through the spine.

The severity of the injury done to the brain necessarily depends on the condition of the individual, and the nature and direction of the force. Minor injuries, especially if the object through which the force is applied is of a yielding nature, usually result in a concussion of the brain. It is for the most part characterized by a transitory loss of consciousness, but in all probability its pathology simulates to a greater or less extent that of the changes produced by a contusion. A few investigators state that this condition belongs more to the contusions and refuse to recognize any other classification.

The changes following a cerebral contusion necessarily vary from the minute to the gross. In the milder form of injury, examination on section may show minute rents in the brain substance with perhaps very small hemorrhages. The

changes in the severer forms are for the most part similar and vary only in degree. The lacerations proper of the brain tissue may be invisible but section will usually show hemorrhages of various size. In the cases in which death ensues the injury may be quite evident to the naked eye, with hemorrhages which may be cerebral proper, subdural or extradural. Post-mortem examination frequently shows the injury of the brain tissue to be opposite the point of contact of the external force. Instead of being localized the change in the cerebral cortex may be diffuse.

The pathologic changes which have just been enumerated are the ones which immediately follow the trauma sustained by the brain, and while there may be resulting physical and psychical symptoms at the time the process must be extended to explain the resulting psychical conditions which we are considering. If the hemorrhage is of considerable severity there is an increase of intracranial pressure, and sooner or later a congestion results. As a result of this congestion, definite and well known pathologic changes ensue, namely, exudation and edema. If the increased pressure continues to exist an anemia results, this being explained by the reduction of the calibre of the blood-vessels as a result of the increased cerebral tension. If the gray matter of the cortex is severely injured the repair is slow, as the lacerations which follow are more or less permanent gaps and are bridged over later by fibrous tissue. This process of repair may seriously interfere with the cerebral circulation and permanent disturbances consequent upon this condition ensue. Punctured wounds with resulting cerebral changes are localized and the pathology is not at all dissimilar to that already mentioned. If there is a distinct loss of brain tissue the changes which result vary in degree. The histology, which has been found to consist of minute hemorrhages and thrombi, cellular infiltration of the vascular walls, lymph spaces, etc., is not essentially characteristic and will not be discussed here.

These, then, in brief, are the most important pathologic changes following cerebral traumatism. The processes which develop from or which follow a continuation of the edema and exudation mentioned above are familiar and will not be considered farther. This pathology is not characteristic, and, as will be seen later, similar conditions are found in other forms of mental disease. While these changes may be sufficient to explain the psychic phenomena which develop, it has not been found that they are distinctive and characteristic of a specific form of mental aberration.

The pathologic changes which have been found in the different forms of mental disease do not differ essentially from those already mentioned. There is no distinctive pathology, but there is not infrequently found in the organic cases degenerative changes in the cortical cells, a decrease in the number of cells, and an increase in the amount of neuroglia tissue. Degenerative processes not infrequently involve the blood vessels. Gross examination of the brain usually shows dense adhesions between the membranes and the cortex, cerebral atrophy varying in degree, an increase of fluid, adhesions at the base of the brain, etc.

If we consider the symptoms which may develop after or follow brain trauma we find that while they are not essentially characteristic their importance cannot be overlooked. The same group of symptoms may be found in the different forms of mental aberration. Two groups of cases must necessarily be considered. In the first group, or those which immediately follow the injury, are found the usual symptoms of shock, vertigo, delirium varying in degree, partial or complete amentia, mental confusion, coma, etc. This class of cases is excluded because the duration is usually short, they terminate in rapid recovery or death from exhaustion, and are not directly associated with the development of a psychosis later. If a psychosis develops later certain well pronounced symptoms must be considered.

Prodromal symptoms are necessarily variable. There may be noticed a change of character, unusual irritability, restlessness, insomnia, apathy, headache, vertigo, changes in the physical condition of the patient, etc. The duration of this period is variable, one case of twenty-three months' duration having been reported.

Confusion varies in degree. The clouding of consciousness may be partial or complete. External impressions may not be comprehended, even intense stimuli may not be understood. Orientation in any one of the spheres may be partially or completely lost. Associated with this condition are usually lack of attention and distractibility. Orientation may be good, but the ability to understand requests, demands, and simple orders may be lost. The processes of this disturbance are necessarily very complicated.

Memory defects depend on the extent of the injury and the condition of the individual at the time of the injury. Disturbances are characterized chiefly by inability to recall former knowledge and important events. Especially is this true as regards the circumstances occurring at about the time of the accident. The absence of impressibility, on which memory depends to a great exent, is explained by the partial or complete clouding of consciousness which was present. Accuracy of memory is especially defective.

Hallucinations may involve any of the special senses. They may be fleeting and transitory or have a permanent character. Hallucinations of sight are especially common. Those of hearing are very frequent and vary from simple sounds to complicated words and sentences. Their development may be peripheral, but for the most part are of a central origin. Illusions or false perceptions are perhaps more common than hallucinations. At times it may be difficult to distinguish one from the other.

The delusions which are usually presented are variable in character. They may be depressing or exhilarating. Their character for the most part depends on their mode of origin. They may be fixed and systematized or unsystematized and vacillating, being usually brief in duration and changing in character. They do not originate in experience, are not based on facts, and are inaccessible to argument. Many of them center in self.

Disturbances of the rapidity of thought and the formation of ideas and concepts may be more or less pronounced. At times there is retardation, again a flight of ideas. Judgment and the power to reason correctly are usually very much diminished. The capacity for mental work as a rule is decreased.

Dementia following traumatism depends on the nature and severity of the causative agent, the age of the individual, the use of alcoholics and the loss of brain tissue. In several of our cases in which trauma is considered the factor in the production of the mental condition, other conditions have been found to be equally important. The degree of mental deterioration will be found to vary. If the individual is not of advanced years the course may simulate paresis. Especially is this true as regards the physical findings and memory defects characteristic of the disease. If the patient is older the picture is usually that of senile dementia. Physically there may be noticed a general tremor, speech disturbances, an increase of the reflexes and an ataxia, partial or complete. The pupils may be dilated, contracted and unequal. They usually respond sluggishly to light and accommodation. In fact, all the symptoms simulate a general paralysis. In this connection it must also be mentioned that following trauma many cases develop an intolerance for alcohol. Just why this occurs has not been fully explained, unless it is that as a result of the trauma certain changes have been produced in the nervous system which makes it very susceptible to various forms of stimuli.

Of the cases admitted to the Illinois Central Hospital for the Insane during the past two years in which traumatism is a factor or is given as an assigned cause, twenty-eight were males and four were females. These figures, it must be understood, are not accurate, but are taken from the court papers which accompany the patient at the time of his admission. Friends and relatives of patients can usually recall an injury received by the patient, and which to them is sufficient to explain the cause of their present condition. Most of us can remember of having received a head injury at some time during our lives. In a few cases this history is perhaps important, but in the majority of cases bears but little relation to the development of the psychosis. Again, for want of a better cause, traumatism is not infrequently given as the assigned cause by the physician on

the jury or by the members of the commission who decide as to the sanity or insanity of the individual. However, as a working basis, the figures given above will have to suffice. Classifying these cases we find a fairly wide variation, though certain groups predominate:

Dementia præcox	10
Paresis	6
Epilepsy	4
Senile dementia	3
Degenerates	1
Not insane, one being a case of hysteria	2
Chronic alcoholism	1
Alcoholic hallucinosis	2
High grade imbeciles	2
Dementia following and due to localized brain injury	1

Of these thirty-two cases traumatism is given as the sole cause in eighteen of them, in the remainder other causes are also assigned. These cases will be considered more in detail, because it cannot be denied that in some of them traumatism bore a certain relationship to the development of the psychosis, and seemed to be more than a mere coincidence. Analyzing these cases again we find that certain groups predominate:

Dementia præcox	4
Paresis	3
Epilepsy	3
Degenerates	1
Senile dementia	2
Chronic alcoholism	1
Alcoholic hallucinosis	1
High grade imbeciles	1
Dementia following localized brain injury	1
Not insane—hysteria	1

That the majority of these cases belong to the dementia præcox and paresis groups can be explained, I believe, by the statement that these two groups constitute a large per cent. of the cases admitted to the insane hospitals. It will be noticed that none of these cases belong to the true paranoias or to the manic depressive groups. The total number of admissions and readmissions to the hospital during this period of time was 1031.

Considering the groups mentioned above more in detail we find that there is but little to support the claim that trauma was the exciting cause in the production of the psychosis. Practically all of the cases of dementia præcox were typical in character and were characterized by more or less profound mental deterioration. In the majority of cases the injury supposed to have been the active agent in the production of the psychosis was received some considerable time previous to its development, often years before. In none of the cases was there any physical evidence in the form of scars, depressions, focal symptoms, etc. Considering the fact that so many causes operate in the production of this psychosis, we are unable to demonstrate or to determine the presence of previous trauma, or to consider the same to be more than possibly a remote contributory cause. For the most part these cases seemed to simulate other cases which are admitted almost daily.

The relation of traumatism to paresis is an interesting subject. Some investigators are inclined to the belief that paresis follows an injury. Others give it but little consideration as an etiologic factor. If the symptoms are first noticed after an accident it is but natural to attribute the cause and subsequent course to this factor. It must be borne in mind, however, that paresis is a slow and progressive disease, and that while the symptoms have apparently developed suddenly, the process has unquestionably existed for some time. This is easily explained when the pathology of the disease is considered. It is characterized essentially by a

gradual degenerative process which involves the cerebral tissue. It is not reasonable to suppose that a condition which is characterized by certain definite and more or less positive physical signs will develop immediately after an accident, but rather that if the condition does develop the injury acted as an exciting cause upon a process which had been gradually developing before. In one of our cases positive physical signs, with incomplete mental symptoms, followed a head injury almost immediately. The patient was intoxicated at the time of the injury, and later a specific history was obtained.

The same relationship was found to exist in the senile and in the alcoholic cases. While the injury was given as the sole cause it was again found that other factors were so pronounced that it could be merely considered a contributary cause. In the one case of localized brain injury the dementia developed soon after the receipt of the injury. Associated with this factor, however, are usually others to be considered, namely, arteriosclerosis and alcoholism. These cases are usually permanent in character.

Injuries received in other portions of the body do not bear as close a relationship to the production of a psychosis as do injuries to the head. Injuries to the central nervous system received indirectly through the spine have already been considered briefly. This cause obviously does not operate as frequently nor as forcibly as do direct injuries to the head. In this class, as in those already considered, a number of predisposing agents play a rôle in the production of the mental condition. Associated with alcoholism, arteriosclerosis, and metallic poisoning must be considered the previous mental condition, perhaps his inferiority, and the environment of the patient. If the injury involves the trunk or the limb it is reasonable to suppose that this agent is a less important factor. The anxiety and worry therefrom may cause a disturbance in the equilibrium of a nervous system which is already below normal from whatever cause. The injury itself, however, cannot be considered as a direct exciting cause, it is only an indirect cause with later manifestations.

I wish to present a brief report of a few cases which have been recently admitted to the Illinois Central Hospital for the Insane, cases in which the relation of the trauma to the development of the psychosis cannot be entirely overlooked. In these cases it will be noticed that the time intervening between the trauma and the development of the insanity varies and that other factors must of necessity be considered as well.

CASE 1.—J. H. A., carpenter, aged 39 years. General health good until the time of the accident. Has used alcohol to excess. While intoxicated patient was thrown from a buggy. His head struck a tree, resulting in a fracture of the lower jaw, scalp wounds and cerebral contusion. Following the injury he was unconscious for some time. Later he became restless, worried about his condition and was inclined to be disturbed. There were insomnia and pronounced speech disturbance.

On admission to the hospital it was found that there was practically a complete loss of orientation; he was very stupid; his speech very much disturbed. There was a marked tendency on the part of the patient to repeat parts of words and sentences said to him. Patient was very careless in his habits and very untidy as regards his personal appearance. Memory was very defective.

Physically there were evidences of recent trauma as explained above. The left pupil was about twice the size of the right, both reacting very sluggishly. The deep reflexes were exaggerated; a tremor was fairly well pronounced and there was a well marked motor aphasia. In fact the mental and physical symptoms simulated that of a general paralysis. In many respects this patient has improved, but his physical signs, speech disturbances and memory defects still persist.

CASE 2.—H. W., farmer, aged 54 years. One parental cousin was insane and a sister was afflicted with melancholia. Patient had an attack of melancholia seventeen years previous to his admission to the hospital. Recovery was evidently complete. During a quarrel three months previous to his admission the patient was struck with the blade of a pocket knife. The blade penetrated about two inches in the left temporal region. Eighteen hours after the injury the skull was trephined, blood clots being removed. Drainage was employed

for two weeks. A hemiplegia developed on the right side, but later this condition practically subsided. Two weeks before his admission patient began to show a marked change in his disposition, becoming quite emotional and irritable. Motor aphasia was also pronounced. He had no delusions or hallucinations. Was inclined to be careless about his habits.

Physically the patient seemed to be fairly well developed and nourished. The arteries were slightly thickened. His gait was inclind to be staggering at times. His coordination was poor and there was a tremor of the extended fingers. The deep reflexes were very sluggish, and the pupils responded to light and accommodation sluggishly. There was also a well pronounced motor and sensory aphasia.

Mentally patient was very much deteriorated. There was a loss of orientation as regards time, place and person. His perceptions were dulled and there was a loss of memory for both past and recent events. There were no hallucinations nor delusions. Patient's mental condition seemed to be that of a dementia with a well marked organic basis due to the traumatism which he had sustained.

CASE 3.—A. M. L., a carpenter, aged 36 years. Family history negative. Patient formerly drank to excess. Two years ago patient fell from a scaffold, injuring his head. He was unconscious for fifteen minutes following the injury. Present mental condition was first noticed one year ago. The onset was characterized by forgetfulness and repetition. Later he became moody and depressed. Depression, irritability and delusions were the most prominent mental symptoms previous to his admission to the hospital. His delusions, for the most part, were those of persecution.

Physically the patient was fairly well developed and nourished. Coordination was fairly good, there was a tremor about the mouth when talking. The knee-jerks were absent. The right pupil was larger than the left, and there was practically no reaction of the pupils to light.

Mentally the patient was fairly well-orientated. There was some confusion, and for the most part patient seemed to be somewhat depressed. He had some hallucinations of hearing, but no pronounced delusions. Memory for both past and present events seemed to be fairly good. Later patient began to fail physically and to deteriorate very much mentally; developed delusions fantastic and grandiose in character. He talks to himself almost constantly and is very careless about his personal appearance and habits. The entire picture has been that of a general paralysis.

CASE 4.—O. E., farm hand, aged 26 years. His physical health has been poor. A wagon ran over patient's head four years ago. The first mental change noticed followed an attack of typhoid fever, but the injury mentioned above is given as the assigned cause. Insomnia and irritability have been the most prominent symptoms.

On physical examination patient was found to be fairly well developed and nourished. The left lobe of the thyroid seemed to be slightly enlarged. Patient complained of pain and numbness on the right side of the head, especially in the occipital region. Tendency to dermographia very well pronounced. Coordination poor. Tremor of extended fingers and tongue. The knee-jerks were brisk.

Mentally the patient was well orientated, and he could give a fairly adequate account of his condition previous to his admission to the hospital. No delusions or hallucinations present, other than the subjective symptoms mentioned above. A few mannerisms have been noted. Patient is deteriorated mentally and belongs to the dementia præcox group.

CONCLUSIONS.

1. Traumatism is a predisposing and not an exciting cause of mental disorders. Other contributory causes are usually present.

2. The cerebral cortex may be injured by direct or indirect violence, the former being the more common way.

3. The pathology of cerebral trauma, either recent or remote, is not characteristic of any one form of mental disease. Similar changes are frequently noted in different forms of insanity.

4. Symptoms which at times follow cerebral traumatism are not essentially characteristic, but their importance cannot be overlooked.

5. Causes assigned by court papers are not accurate for obvious reasons.

6. Traumatism was given as an assigned cause in approximately 1.7 per cent. of our cases. The analysis of most of these cases shows that traumatism was not the real exciting cause.

7. If paresis follows an accident it usually is the result of a cause acting upon a process which has existed for some time.

8. Organic dementias are permanent in character. Other factors usually contribute to their production.

9. Injuries sustained in other parts of the body do not bear as important relation in the production of a psychosis as do injuries of the head.

CONTINUATION OF DISCUSSION ON EXOPHTHALMIC GOITER.

Dr. Ferguson (closing the discussion):—I think it would be a good thing if we could find out the toxicity of the blood before operating on the extreme cases. I have done something in that direction, but not enough. I would like some one else (or several for that matter) to take up this phase of the subject and find out the toxicity of the blood with a view to determining whether these cases can be operated on with impunity or not.

Another thing which has impressed me is the use of simple drainage. In 1889 a surgeon of London, England, treated cases of goiter with the use of silver tubes. He would insert three or four of these small trocar and cannula tubes into the neck. He got good results in cases of cystic goiter, and also obtained some benefit from the drainage in the cases of the exophthalmic type. Of course, we do not countenance to-day the injection treatment in cases of exophthalmic goiter, but still good results, according to reports in the literature, have been obtained from this method of treatment. It has occurred to me that if one put a large seton from pole to pole on each side of the neck, under local anesthesia, in cases where the acuteness of the disease does not ease up, a great deal of good might be accomplished. We know that it is always best not to operate during the acute stage. In many of these cases the acute storm continues until the patient dies unless something is done. Some of these patients get better by operation. Of course, we must try and overcome the aggravation of the disease before operating, if possible. The vast majority of such cases will die by a thyroidectomy, while a minimum operation may do some good.

With regard to the use of chloretone, I am sure that Dr. O'Byrne could take 15 grains of this drug, three times a day, and it would not inconvenience him in the least. I do not think it would put him to sleep. A dog can take more than 50 grains. This large dosage has not been jumped at, but we have led up to it by degrees. We have found out the amount required. In this connection I wish to mention a mistake in connection with the use of chloretone. One of my interns made the mistake of giving a child, aged nine months, forty grains of chloretone. After having been informed of what had happened, I hurried to the hospital, and found the child, although a little blue, to be in no serious danger. In less than half an hour thereafter I operated on it for cleft palate, and it made a perfect recovery. In view of that fact, Dr. O'Byrne need not hesitate to take this large dose. Chloretone has the effect of lessening oxidation, and a patient with exophthalmic goiter has too much oxidation going on. Chloretone is a safe agent to give in these cases.

NEWS OF THE STATE

PERSONAL.

Dr. Jacob Huber, Pana, is reported to be seriously ill.

Dr. Emma B. Standley, Alexis, is taking a trip to the Orient.

Dr. Harry G. Hill and family, Streator, leave January 15 for Europe.

Dr. Thomas M. Aderhold, Ziegler, has decided to locate in El Reno, Okla.

Dr. and Mrs. Jacob Frank, Chicago, have sailed for Europe and the Orient.

Dr. and Mrs. Harry C. Hill and family, Streator, have started for Europe.

Dr. Henry D. Shonts is critically ill with pneumonia at his home, Chicago.

Dr. Richard H. Street has been appointed fleet surgeon of the Chicago Yacht Club.

Dr. M. William Fitzpatrick, Decatur, has been elected physician of Mason county.

Dr. Ora L. Pelton, Jr., Elgin, will return from Europe about the middle of February.

Dr. Ira O. Paul, Winnebago, was thrown from his sleigh, December 24, fracturing his left hip.

Dr. Joseph DeSilva, Rock Island, has been appointed a commissioner for the Joliet Penitentiary.

Dr. Myer Nuta, Chicago, was operated on for double hernia by Dr. Thomas Jonnesco, December 22.

Dr. Rachel Watkins has been appointed temporarily assistant physician to the Peoria State Hospital.

Dr. George L. Eyester, Rock Island, who has been under treatment in Chicago, has entirely recovered.

Dr. V. H. Podstata has resigned as superintendent of the Northern Illinois Insane Hospital at Elgin.

Dr. W. P. Short, Mason City, 92 years old, is reported to be seriously ill at St. Clara's Hospital, Lincoln.

Dr. Robert C. Bourland has been appointed district medical examiner by the civil service board, Rockford.

Dr. William M. Richards, Joliet, was operated on for appendicitis at Silver Cross Hospital, December 24.

The office building of Dr. William W. Houston, Good Hope, was seriously damaged by fire, January 10.

Dr. J. T. Black, one of the staff of the Illinois Asylum for Feeble-Minded Children, Lincoln, has resigned.

Dr. Carl G. S. Rydin has resigned from his position in the Kankakee State Hospital, to take effect February 1.

Dr. Eli V. Rice, Chenoa, who has been seriously ill with inflammatory rheumatism, is reported to be convalescent.

Dr. Martin Saucerman, Rock Grove, has left Freeport Hospital, where he has been a patient for the past six weeks.

Dr. Frank B. Earle, Chicago, has been elected a surgeon of the local organization of the Society of Colonial Wars.

Dr. George H. Brannon, Manhattan, who was recently operated on in St. Joseph's Hospital, Joliet, has returned home.

Dr. Francis E. Melugin, Thomson, was operated on recently at Mercy Hospital, Clinton, for disease of the gall-bladder.

Dr. Eleazer A. LaMothe has been elected professor of ophthalmology in the Chicago Eye, Ear, Nose and Throat College.

Dr. Thomas F. Doyle, Chicago, was seriously burned on the head and face by a gas explosion in his bath room, December 19.

Dr. John F. Taylor, Buda, has been obliged to give up practice on account of ill health, and will soon leave for Montana.

Dr. Eugene S. Talbot, Chicago, has been appointed a corresponding member of the Budapest Royal Society of Physicians.

Dr. George H. Brannon, Manhattan, has recovered from his recent operation at St. Joseph Hospital, Joliet, and returned home.

Dr. and Mrs. Walter Ryan, Springfield, have left for the East, and will sail in June for Europe, where they expect to remain a year.

Dr. Percy C. Hoffmann, Jacksonville, was accidentally shot through the right foot, January 3, while hunting, the injury necessitating amputation.

Dr. Effie Current, formerly of Danville, who went to Colorado for her health, has taken up professional work in a tuberculosis sanatorium in Brush.

Dr. John A. Cavanaugh has been appointed professor of otology, rhinology and laryngology in the Chicago Eye, Ear, Nose and Throat College.

Dr. John A. Cavanaugh, Chicago, has been elected Professor of Otology, Rhinology and Laryngology in the Chicago Eye, Ear, Nose and Throat College.

Dr. Benjamin E. Gleeson, Danville, has been appointed local oculist and aurist to the Illinois Traction System and the Chicago and Eastern Illinois Railway.

Dr. Warren E. Taylor, superintendent of the Watertown State Hospital, is said to have resigned, and Dr. William A. Crooks to have been named acting superintendent.

Dr. Emil Lofgren has been elected president, Dr. Don A. Vanderhoof, vice-president, and Dr. George R. Gill, secretary-treasurer, of the staff of St. Anthony's Hospital, Rockford.

Drs. George W. Mitchell and J. G. Oosterbeck, assistant physicians at the Bartonville State Hospital, have resigned as the result of action taken by the Illinois Civil Service Commission.

NEWS ITEMS.

—The Whiteside Public Hospital, Sterling, is completed and ready to receive patients.

—The net receipts of the annual charity ball in Chicago amounted to $29,000, which is to be distributed among twelve institutions.

—At a benefit given January 13, at the Illinois Theater for the endowment of a bed at St. Joseph's Hospital, $1,500 was netted.

—A fire, December 19, at the Watertown State Hospital, totally destroyed the amusement hall of that institution, causing a loss of about $10,000. No casualties to patients resulted.

—The physicians of Cuba have formed an organization and elected Dr. David S. Ray, president, and Dr. Veda C. Murphy, secretary. All the practitioners of the city have enrolled as members.

—In the December Bulletin of the Illinois State Board of Health the secretary, Dr. James A. Egan, makes a strong plea for the establishment of a state sanatorium for tuberculosis.

—County secretaries are requested when reporting election of officers to give the *address* of each officer elected. Of course, all reports and articles for publication to be furnished *typewritten* and *double spaced*.

—The trustees of the Illinois Western Hospital for the Insane, Watertown, met December 30, and made their final reports and arranged details for turning the hospital over to the State Board of Administration.

—The death rate for Chicago in 1909 was 14 per 1,000 inhabitants, the fourth lowest in the history of the city, and the lowest of any American city having 300,000 population, except Cleveland, which had a rate of 13.11.

—A gift is said to have been made to the Iroquois Memorial Association, sufficient to complete the building fund for the hospital to be erected at 87 Market street, Chicago, which is to cost between $50,000 and $75,000.

—The Chicago Odontographic Society gave an elaborate banquet January 29, in the gold room of the Congress Hotel, in honor of Dr. Greene V. Black, M.D., D.D.S., Sc.D., LL.D., Dean of Northwestern University Dental School.

Dr. E. I. Whitehead, of Victoria, Ill., and family are spending the winter at East Las Vegas, N. M. Dr. Whitehead expects to locate somewhere in the Southwest in the spring. Dr. Whitehead has sold his practice to Dr. H. E. Opre, of Chicago.

—There are vacancies in the positions of assistant physician in practically all the state institutions because of additions to the staff made by the present Board of Administration. Notice of examination for these positions appears in our advertising pages.

—By the will of the late Thomas Murdock, Chicago, who died Christmas Day, one-third of $2,500,000 is devised to the Presbyterian Hospital, to be used for an endowment fund, to be known as the Jane Murdock Memorial Fund, in memory of the sister of the donor.

—Certain dealers in malt and brewery slops advertised in the country papers that the Chicago department of health now permitted the feeding of wet malt to dairy cattle. But the farmers found that they were buncoed again when the inspectors discovered them using the malt.

—The Cook County budget for the fiscal year 1910 shows an increase of $307,829.41 as compared with the appropriation of the previous year. The new Oak Forest Infirmary is to receive $111,309.42, the Dunning Institutions $389,622.76, and the Cook County Hospital $473,500.70.

—Dr. Caroline Hedger, at a meeting of the Chicago Association of Day Nurseries, January 13, launched a movement to place all public nurseries in Illinois under the state law, the proposed law following in the general lines of the law at present in force in New York State.

—The last quarterly bulletin of the Illinois Board of Charities gives the following as the net cost per capita of maintaining each of the state hospitals for the year: Chester, $44.69; Kankakee, $38.23; Peoria, $37.75; Anna, $37.54; Jacksonville, $34.15; Elgin, $33.88, and Watertown, $31.97.

—The new tuberculosis hospital on the grounds of Cook County Hospital is overcrowded with patients. Several have had to be turned away and sent to the Dunning Hospital, and twenty tuberculosis patients have been placed in another department of the hospital on account of the overcrowded condition.

—The State Board of Administration, on January 4, ordered the discharge of Dr. George W. Mitchell, the first assistant physician, and Dr. J. G. Oosterbeck, second assistant physician of the Peoria State Hospital, who were charged with negligence in the performance of duty, and who failed to respond to the request of the state civil service commission for their resignation.

—A medical science room in the Evanston Public Library has been established by friends of Dr. Edward H. Webster, in his honor. The room will contain the Christopher Library, the Brayton Collection, and the new endowment provides $3,000 for the support of a library on general medicine, and not less than $1,500, the income of which is to be used in the maintenance of the room.

—Investigation by Chicago physicians disclosed the fact that many druggists continue to charge high prices for diphtheria antitoxin in spite of the agreement of the Retail Druggists' Association with the department of health to sell at lower prices. Physicians who have the financial interest of their patients at heart can readily secure the lower-priced antitoxin introduced by the McCormick Memorial Institute.

—The president of the Board of Commissioners of Cook County has appointed a committee of six, consisting of Dr. William L. Baum, the warden of the County Hospital, the county attorney and three county commissioners to meet a similar committee appointed by the city council, consisting of Drs. William A. Evans and Heman Spalding, the corporation counsel and three aldermen, to discuss ways and means of turning over the county hospital to city control.

—Under the new board of administration of charities, the following superintendents of charitable institutions have been reappointed: Dr. Vaclav H. Podstata, Elgin State Hospital; Dr. Frank P. Norbury, Kankakee State Hospital; Dr. Henry B. Carriel, Jacksonville State Hospital; Dr. William L. Athon, Anna State Hospital; Dr. Warren E. Taylor, Watertown State Hospital; Dr. George A. Zeller, Peoria State Hospital; Dr. C. P. Henderson, Chester State Hospital, and Dr. Harry G. Hardt, Lincoln School and Colony.

—The governor on December 31 reappointed Drs. Frank Billings, Chicago, and John T. McAnally, Carbondale, Rev. Emil G. Hirsch, Chicago, and John D. Harris, Champaign, members of the State Board of Charities, as the new State Charities Commission. At the first meeting of the commission, held January 8, Dr. Frank Billings, Chicago, was elected president, and Mr. William C. Graves, secretary of the old commission, was appointed executive secretary. The secretary was instructed to map out a plan whereby the work of the commission may reach not only the seventeen state charitable institutions, but also every county poor house and jail in the state.

—The president of the Board of Commissioners of Cook County, in his annual message, notes an increase of 31 per cent. in the admissions to Cook County Hospital between 1903 and 1908, and an increase of 56 per cent. in the daily average population. During 1909 there was an increase of 11 per cent. over 1908 in the daily population, or of 73 per cent. over 1903. He advises comprehensive hospital plans, including the rebuilding of the old portions of the present hospital, so as to accommodate 2,500 patients, this to be done gradually so as to interfere as little as possible with the existing hospital provisions.

—The new factory law which requires employers to promote the health, comfort and safety of employees went into effect January 1. The new law provides for the protection of the employees against machine injury, by enclosed hatchways, elevators, etc.; the keeping of premises in clean sanitary condition, of equal temperature, and with toilet facilities, and prohibits the taking of food into rooms where poisonous substances are present; prescribes the removal of poisonous or noxious fumes

as far as practicable, and a report to the state factory inspector of all accidents or injuries resulting in death. Failure to comply with any provision of this act is punishable by a fine of from $10 to $50 for the first offense, and from $25 to $200 for the second.

—The Society of Medical History of Chicago has been recently organized, with Dr. Isaac N. Danforth as president, Dr. N. S. Davis as vice-president, and Dr. George H. Weaver as secretary. Its council consists of Drs. Ludvig Hektoen, George H. Weaver, John Edwin Rhodes, N. S. Davis, Henry T. Byford and George Henry Cleveland. Dr. Howard A. Kelly, of Baltimore, will deliver the address at the first meeting, which will occur on the evening of Feb. 19, 1910. The society has been formed for the purpose of systematically collecting and permanently preserving in an accessible manner any matters which are or will become of interest in connection with the medical history of institutions, organizations and individuals, especially of Chicago and the surrounding states. The society asks the active support and help of the profession in its efforts to secure the desired materials. It makes a special appeal to those outside of Chicago for anything antedating the Chicago fire. All communications should be sent to Dr. George H. Weaver, secretary, 1743 West Harrison street, Chicago.

MEDICAL SOCIETY NOTES.

The St. Clair County Medical Association held its annual meeting at Priester's Park, January 5, and elected the following officers: President, Dr. George E. Hilgard, Belleville; vice-president, Dr. Charles Skaggs, East St. Louis; secretary, Dr. E. H. Lane, French Village; treasurer, Dr. Adolph Hansing, Belleville. Dinner was served. Dr. Marshallton, of Washington University, St. Louis, delivered a lecture illustrated with stereopticon views. Plans are now under way to entertain the American Medical Association, when it meets in St. Louis next June.

The following resolutions were submitted by Dr. Noble at the meeting of the Council of the Chicago Medical Society January 11:

WHEREAS, the Chicago Medical Society is an integral part of a constituent society of the American Medical Association, and therefore vitally interested in the welfare of that great organization, and

WHEREAS, certain conditions exist which menace the best interests of the members of the American Medical Association, and of the profession at large; therefore, be it

***Resolved*, that the Chicago Medical Society in council assembled recommends the following changes in the policies and management of the American Medical Association, viz.:**

1. The laws should be so amended that no one person will be permitted to hold, at the same time, more than one executive or honorary office in the Association.

2. The office of General Secretary, and the positions of Editor and Manager should be separated, and no person should be permitted to fill more than one of these places at one time.

3. The offices of Editor and Secretary should be filled only by men educated in regular scientific medicine and of unimpeachable professional records.

4. The number of Trustees should be increased.

5. All officers and employees whose duties involve financial responsibility should be bonded.

6. The laws governing admission to membership in the American Medical Association should be so amended as to make it mandatory upon the secretary to enroll applicants who have complied with the provisions and the by-laws governing the same.

7. Space should be set apart in the *Journal* for free and courteous discussion of the policies and methods of the Association, or for any other matters which may appeal to the membership at large as bearing upon the interests of the Association.

8. Provision should be made for the initiative and referendum.

9. No member should be expelled from the Association without a fair trial and full hearing.

10. No person who is a general officer or member of the House of Delegates or Board of Trustees or employee of the American Medical Association should be eligible to serve as a general officer or member of the House of Delegates, or Council, of any constituent Association.

11. *Be it further resolved*, that the Secretary of the Chicago Medical Society be instructed to publish these resolutions in full in the *Bulletin* of the Society, and to transmit a copy of the same to the *Journal* of the American Medical Association and to the editors of the various state journals.

The resolutions were discussed by W. A. PUSEY, JAMES E. STUBBS, M. Z. ALBRO and M. L. HARRIS.

On roll-call vote, they were adopted.

PUBLIC HEALTH.

—A lie to the effect that several Chicago hair dressers had become infected with leprosy from Chinese hair was recently nailed by the Health Department after thorough investigation.

—Better join the army of "fresh-air cranks" and stick around a while longer. Those who go on breathing dirty air will continue to be recruits for the vast army of pneumonia and consumption victims now marking time in the "pearly streets."—From the *Bulletin of the Chicago Department of Health.*

—The Chicago Health Department has arranged to send duplicate death certificates to the census bureau, which will classify them and return the tabulation for publication in the Bulletin at a later date. It has also adopted the latest revision of the international classification of the causes of death. In the new certificate an attempt is made to discover the exact occupation of the decedents at the time of contracting the fatal disease.

—The appropriation for the Chicago Health Department, as finally passed by the council, was $545,118, nearly 10 per cent. less than the appropriation for 1909. This gives the munificent sum of 23.8 cents per person. Mr. Riis, the New York sociologist, spoke of the department as a model of efficiency, and urged more liberal treatment by the city council. A reduced appropriation for an admittedly efficient department, when

the total budget calls for many millions more than ever before, and some other departments of the city government are openly accused of squandering large sums of money, looks like a penalty on efficiency and economy.

—On December 6, the governor appointed as members of the State Food Standard Commission, Charles E. M. Newton, "a representative of the Illinois Food Manufacturing Industries," and Dr. Walter S. Haines, Chicago, "an expert food chemist of known reputation," in accordance with the requirements of the law, and these gentlemen constitute the State Food Commission, with Mr. A. H. Jones as chairman, Dr. T. J. Bryan, 1620 Manhattan Building, Chicago, as corresponding and recording secretary. Among the early subjects to be considered are ice cream, condensed milk and evaporated milk. The commission will not make a standard until it has fully investigated both scientific data with reference to the products, and the trade conditions and customs relating thereto. It requests all interested to submit briefs in triplicate to the secretary of the commission at as early date as possible. After these briefs have been considered, a public hearing will be given to those interested, for the presentation of evidence and arguments.

NEW INCORPORATION.

Chicago Surgical and Electrical Company, $10,000; surgical and electrical instruments; T. Lidberg, A. Frick, G. A. Jacobs.

MARRIAGES.

Robert Abercrombie Smith, M.D., to Miss Emily Wilk, both of Chicago, Jan. 1, 1910.

Guy Carson Kinnaman, M.D., to Miss Ivy Irene Brown, of Morrison, Ill., Dec. 29, 1909.

Edwin F. Stannus, M.D., to Miss Eolia Miller, both of Quincy, Ill., at St. Louis, Dec. 16, 1909.

Bradford Allen Camfield, M.D., to Miss Augusta Esther Butts, both of Chicago, Dec. 23, 1909.

Ernest Paul Murdock, Jr., M.D., Chicago, to Miss Edythe Wood, of Albany, N. Y., Dec. 27, 1909.

George Warner Mosher, M.D., Chicago, to Mrs. Mary Isabelle Fixen, of Racine, Wis., Jan. 5, 1910.

DEATHS.

Joseph P. Gray, M.D. University of Cincinnati, 1908; died at Springfield, aged 23, from erysipelas.

Amos L. Norris, M.D. Rush Medical College, 1872; died at his home in Farmer City, Ill., December 16, from paralysis, aged 62.

JOSIAH RAYMOND KELLY, M.D. University of Michigan, Ann Arbor, 1872; died at his home in Quincy, Ill., July 2, from dysentery, aged 62.

JOHN BAPTIST KNOEBEL (license Ill.); a practitioner of nearly fifty years; formerly of Highland, Ill.; died at his home in Manitou, Colo., January 1, aged 77.

OSCAR MARTIN DUNCAN, M.D. University of Louisville (Ky.) 1907; formerly of Bridgeport, Ill.; died in Bay St. Louis, Miss., October 23, from bronchopneumonia, aged 34.

WALTER CROOKS BOWERS, M.D. Rush Medical College, 1882; a member of the American Medical Association; died at his home in Decatur, December 31, from pneumonia, aged 52.

SAMUEL WHEELER SHAW (years of practice, Ill., 1901); for forty-seven years a practitioner of Chicago; died at his home in that city, December 20, from arteriosclerosis, aged 86.

CHARLES ALBERT PALMER, M.D., Northwestern University Medical School, Chicago; died at his home in Princeton, November 6, of anemia with toxic degeneration of the cord, aged 54.

RICHARD A. PINKLEY (license, Ill., years of practice, 1877); for forty years a practitioner of Illinois; died at his home in Bushnell, December 16, from cerebral hemorrhage, aged 76.

ALMON BROOKS, M.D. University of Virginia, Charlottesville, 1865; a prominent specialist in internal medicine; died at his home in Chicago, December 25, from valvular heart disease, aged 68.

JOSEPH GILBERT GRAY, M.D. Medical College of Ohio, Cincinnati, 1909; who was about to open an office in Springfield, Ill.; died at St. John's Hospital in that city, December 31, from erysipelas, aged 23.

CHARLES P. GEUDTNER, M.D. Rush Medical College, 1896; a member of the Illinois State Medical Society; a specialist on diseases of the eye; died at his home in Chicago, January 5, from pneumonia, aged 44.

HENRY D. SHONTS, M.D. Philadelphia; for nearly seventy years a practitioner of medicine; and for more than half of that time in Centerville, Iowa; died at his home in Chicago, January 10, from pneumonia, aged 86.

OTTO FIKENSCHER, M.D. Barnes Medical College, St. Louis, 1897; of Sibley, Ill.; a member of the American Medical Association; died at the home of his parents in Lohman, Mo., January 6, from pneumonia, aged 37.

FRED ROBERT DISNEY, M.D. College of Physicians and Surgeons, Chicago, 1907; a member of the Oklahoma State Medical Association; formerly of Chicago; died at his home in Pocasset, Okla., December 25, from pneumonia, aged 31.

THOMAS J. SHAW, M.D. Rush Medical College, 1880; for twenty years assistant demonstrator of anatomy and clinical assistant to the professor of gynecology in his alma mater; died at his home in Chicago, January 20, from senile debility, aged 68.

OTTO FIKENSCHER, M.D., of Sibley, Ill., died of pneumonia, Jan. 6, 1910, at the age of 38 years. He had practiced at Sibley for eight years. He was a graduate of Barnes Medical College, St. Louis, and was a member of the Ford-Iroquois Medical Society.

HOWSON WHITE COLE, M.D. Jefferson Medical College, 1854; a member of the Medical Society of Virginia; surgeon in the Confederate service during the Civil War; thrice mayor of Danville; died at his home in that city, January 8, from senile debility, aged 79.

WILLIAM HENRY ST. CLAIR (years of practice, Ill., 1877); a member of the American Medical Association; said to have been the oldest practitioner of Effingham county, Ill., where he had practiced for forty-two years; died at his home in Effingham, November 19, from heart disease, aged 81.

GEORGE SINTZEL, M.D. Missouri Medical College, St. Louis, 1878; for thirteen years president of the village council of Niles Center, Ill.; and formerly a member of the staff of St. Francis Hospital, Evanston and Cook County Hospital; died at his home Jan. 2, 1910, from pneumonia, aged 53.

AMOS L. NORRIS, M.D., died in Farmer City, Dec. 15, 1909. Dr. Norris practiced medicine in Illinois thirty years; was advisor on Pension Board of De Witt County; physician and surgeon of the Illinois Central R. R.; member of the Court of Honor and Modern Woodmen of America; he died of paralysis and uremia.

DON MORRISON WAGGONER, M.D., of Lewistown, Ill., Fulton County, died Jan. 1, 1910, aged 48, on the steamer *Cleveland*, near Kobe, Japan. Dr. and Mrs. Waggoner left home October 15 for a tour around the world, and the sad termination of this outing was his death at sea as above stated. The doctor developed symptoms of cancer of the tongue about two years ago, and had borne the agonies of this terrible affliction with fortitude. He was born Jan. 11, 1861; the son of Hon. Daniel Waggoner, at one time sheriff of the county. He graduated at Rush in 1881 and the following year at Bellevue Hospital Medical College, New York City. Since then he has been engaged in practice and had built up a reputation as one of the foremost physicians and surgeons in that part of the state. By frugality and shrewd investments he accumulated a snug fortune which he leaves to his wife. The doctor had also taken a number of post-graduate courses, and thus kept up with the times; besides he was square with his brother physicians and patients, who now with his family lament his early decease.

FIGHTING TUBERCULOSIS.

SOME THINGS CHICAGO IS DOING TO CONTROL THE "GREAT WHITE PLAGUE."

There are indications that the fight against tuberculosis throughout this country is to be waged with greatly increased vigor during the coming year. Inquiries are being received from all parts for information as to what Chicago is doing to control this disease. In response to these inquiries the following brief summary of the methods and agencies employed in this city is presented:

1. Reports of all living cases—all forms of tuberculosis—are required by ordinance. Card index of cases kept by premises and by individuals. All cases are spotted on maps of city. Statistical studies of cases and of deaths are made in detail.

2. Living cases are supplied with pamphlet setting forth proper care and treatment of patients, attendants and other contacts.

3. Living cases are furnished free treatment and advice at any of the eight free dispensaries maintained by the Chicago Tuberculosis Institute. Nurses from these dispensaries visit homes of patients for the purposes of observing living conditions and to give advice to patients, their families and attendants. They also visit all homes where deaths from tuberculosis have occurred.

4. The Chicago Tuberculosis Institute maintains the Edward Sanatorium at Naperville, Ill., for treatment of early cases.

5. The Jewish Women's Clubs of Chicago maintain the Winfield Tuberculosis Sanatorium at Winfield, Ill. (not far from Chicago), for the treatment of incipient cases. This institution is endowed.

6. For the care and treatment of early cases, the city is about to build a large sanatorium, such having been approved by popular vote—of more than four to one—at the Spring election of 1909. A tax levy of one-half mill provides nearly $500.000 yearly for building and maintenance. This Municipal Tuberculosis Sanatorium will probably be opened before the close of 1910.

7. The County maintains a large hospital at Dunning, just outside the City, for care of late cases.

8. The new County Tuberculosis Hospital, on the grounds of the County Hospital, near the center of population, has recently been opened. Accommodations are provided for 300 advanced cases.

9. The Chicago Tuberculosis Institute, cooperating with the Board of Education, maintains, during the summer, an open-air school for tuberculous children—with splendid results. For the 30 children in attendance during the summer of 1909, a net gain of 115 pounds in weight was recorded, temperatures were reduced to normal, nervousness was controlled and physical conditions generally were greatly improved.

10. During the colder months of winter further experiments in open-air treatment of junior classes in certain public schools have been carried on. Classes are conducted in school rooms with windows removed, the children being dressed warmly to prevent body chill. The result has been improved health, stimulated mental activity and control of nervous tendencies.

11. Special efforts are put forth to encourage early diagnosis. Tuberculin for diagnostic purposes is supplied free by the Chicago Health Department.

12. Laboratory facilities of the Health Department are available to physicians for diagnosis of tuberculosis, without charge.

13. Disinfection of tuberculosis premises is performed.

14. Some ordinance regulations:

(a) Milk sold in Chicago must come from tuberculin tested cows or be pasteurized. The same requirement applies to milk products—butter, buttermilk, cheese, etc.

Samples of milk are taken daily for laboratory exaination. Special attention is given to bacterial count of pasteurized milk.

Cows kept in city must be tuberculin tested, otherwise permit to keep is refused.

Only bottled milk can be sold in stores where other merchandise is sold.

(b) Meat sold in Chicago must bear Federal or City inspection stamp "Approved" or "Passed."

(c) Foodstuffs offered for sale—especially on streets—must be screened against dust and flies.

(d) Employment of consumptives in manufacture or handling of foodstuffs is prohibited by ordinance.

(e) Spitting in public places is prohibited. Violators are prosecuted from time to time—to serve as warning to others.

(f) Ordinances regulating ventilation, lighting and overcrowding in homes, workplaces, public halls, conveyances, etc., more rigidly enforced than ever before.

15. Outdoor life and recreation is markedly encouraged in Chicago. This city, notwithstanding it already has the largest park area and the largest number of parks of any city in the world, is steadily and systematically increasing its parks each year. A policy, largely followed in recent years, is to establish these "breathing spots" in the more congested areas of the city.

Public playgrounds for children have also been established in the densely populated areas, thirteen now being in operation and more are being created.

16. Personal cleanliness is promoted through the establishment of sixteen free public baths in those parts of city where bathing facilities in the homes are very limited. More are under construction. Upwards of 900,000 persons availed themselves of these free baths during the last year.

Free bathing beaches are in operation during the summer months.

17. Educational work—the most important factor in the reduction of tuberculosis—is actively carried on by the City, the State and by civic and philanthropic organizations. The Department of Health of Chicago contributes to this work as follows:

(a) Lectures, illustrated and otherwise, are given almost daily by the Commissioner of Health and Bureau Chiefs, before gatherings in churches, schools, clubs, public halls, etc.

(b) The Department issues a weekly Bulletin devoting much attention to tuberculosis—some simple story with words of timely advice. These Bulletins are mailed to all teachers, preachers, physicians, settlement workers and others interested in health conservation.

(c) Graphic displays of tuberculosis statistics are prepared for hanging in school rooms, church lecture rooms, clubs, lodge rooms and other public places. Each of these "picture lessons" carry some tersely worded preachments along the margins.

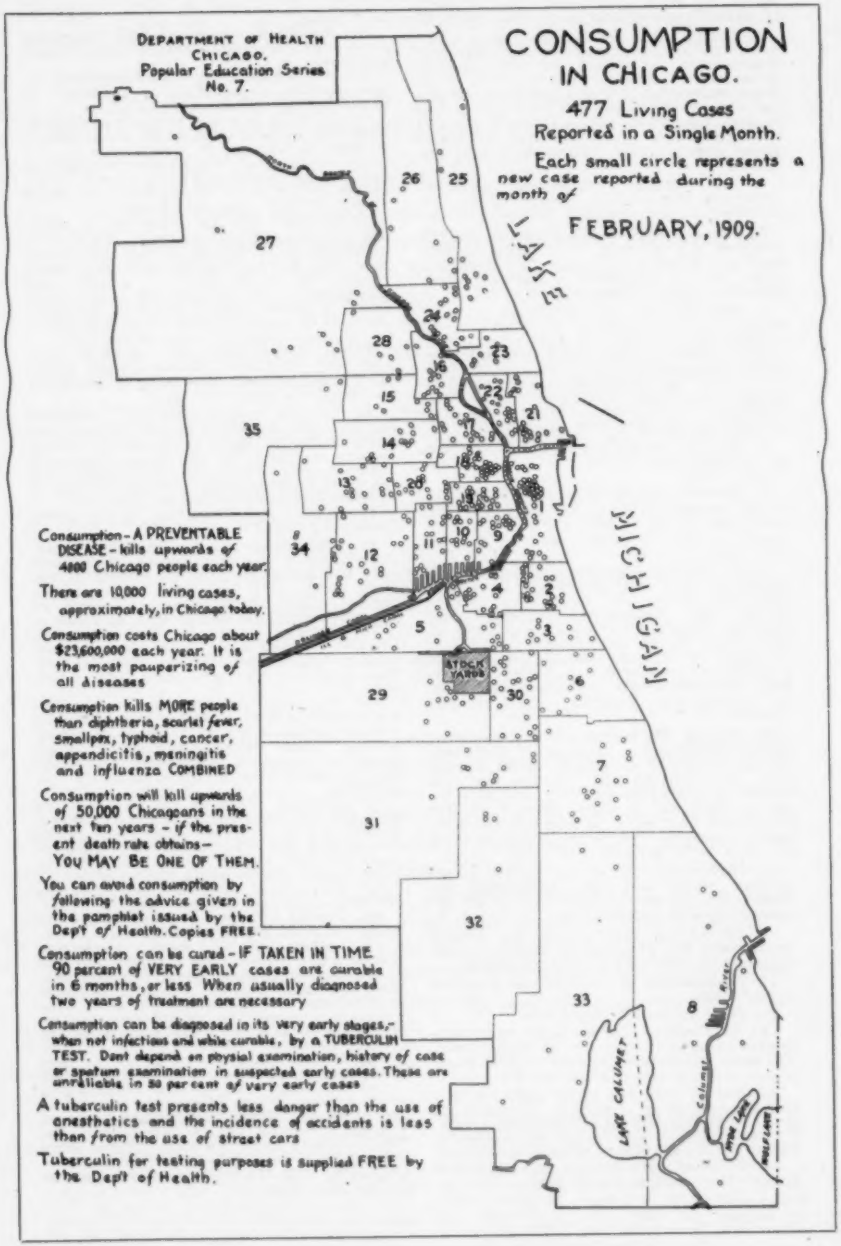
(d) Placards of advice are carried in the advertising spaces of street cars.

(e) Posters of brief, crisp statements are hung in factories, department stores, etc.

(f) Leaflets giving short, interesting stories about tuberculosis are prepared and distributed each week among the neighborhood newspapers, trade journals, fraternal publications, etc. Advice is thus given wide circulation among the foreign speaking inhabitants of the city in the language of the readers of these publications.

(g) Pamphlets of advice as to the care and treatment of tuberculosis are distributed.

(h) The daily newspapers of Chicago give much space to words of warning and advice issued by the Health Department. One of Chicago's leading papers inaugurated the "Daily Health Hint"—a short printed story driving home some important health fact—displaying it in the most prominent position on its front page.


DEPARTMENT OF HEALTH
CHICAGO.
Popular Education Series
No. 7.
CONSUMPTION
IN CHICAGO.
477 Living Cases
Reported in a Single Month.
Each small circle represents a new case reported during the month of
FEBRUARY, 1909.
LAKE
MICHIGAN
STOCK YARDS
Consumption - A PREVENTABLE DISEASE - kills upwards of 4000 Chicago people each year.
There are 10,000 living cases, approximately, in Chicago today.
Consumption costs Chicago about $23,600,000 each year. It is the most pauperizing of all diseases
Consumption kills MORE people than diphtheria, scarlet fever, smallpox, typhoid, cancer, appendicitis, meningitis and influenza COMBINED
Consumption will kill upwards of 50,000 Chicagoans in the next ten years - if the present death rate obtains - YOU MAY BE ONE OF THEM.
You can avoid consumption by following the advice given in the pamphlet issued by the Dept of Health. Copies FREE.
Consumption can be cured - IF TAKEN IN TIME. 90 percent of VERY EARLY cases are curable in 6 months, or less. When usually diagnosed two years of treatment are necessary
Consumption can be diagnosed in its very early stages, - when not infectious and while curable, by a TUBERCULIN TEST. Dont depend on physical examination, history of case or sputum examination in suspected early cases. These are unreliable in 80 per cent of very early cases
A tuberculin test presents less danger than the use of anesthetics and the incidence of accidents is less than from the use of street cars
Tuberculin for testing purposes is supplied FREE by the Dept of Health.